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SOCIETE BELGE DE MALACOLOGIE

New species and new records of Seguenzioidea and Trochoidea (Gastropoda) from French Polynesia

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KEYWORDS. Gastropoda, Société, Australes, Tarava, Calliotropidae, Chilodontidae, Cantharidinae, Calliostomatidae, Margaritinae, *Calliotropis*, *Herpetopoma*, *Thalotia*, *Calliostoma*, *Gaza*, new species.

ABSTRACT. New records of eight known Seguenzioidea and Trochoidea species from French Polynesia area are listed, extending the distribution area of some of them. Seven new species are described and compared with similar species: *Calliotropis ammos* n. sp., *Herpetopoma poichilum* n. sp., *Thalotia tiaraeides* n. sp., *T. khlimax* n. sp., *T. polysarchosa* n. sp., *Calliostoma (Fautor) lepton* n. sp., *Gaza polychoronos* n. sp.

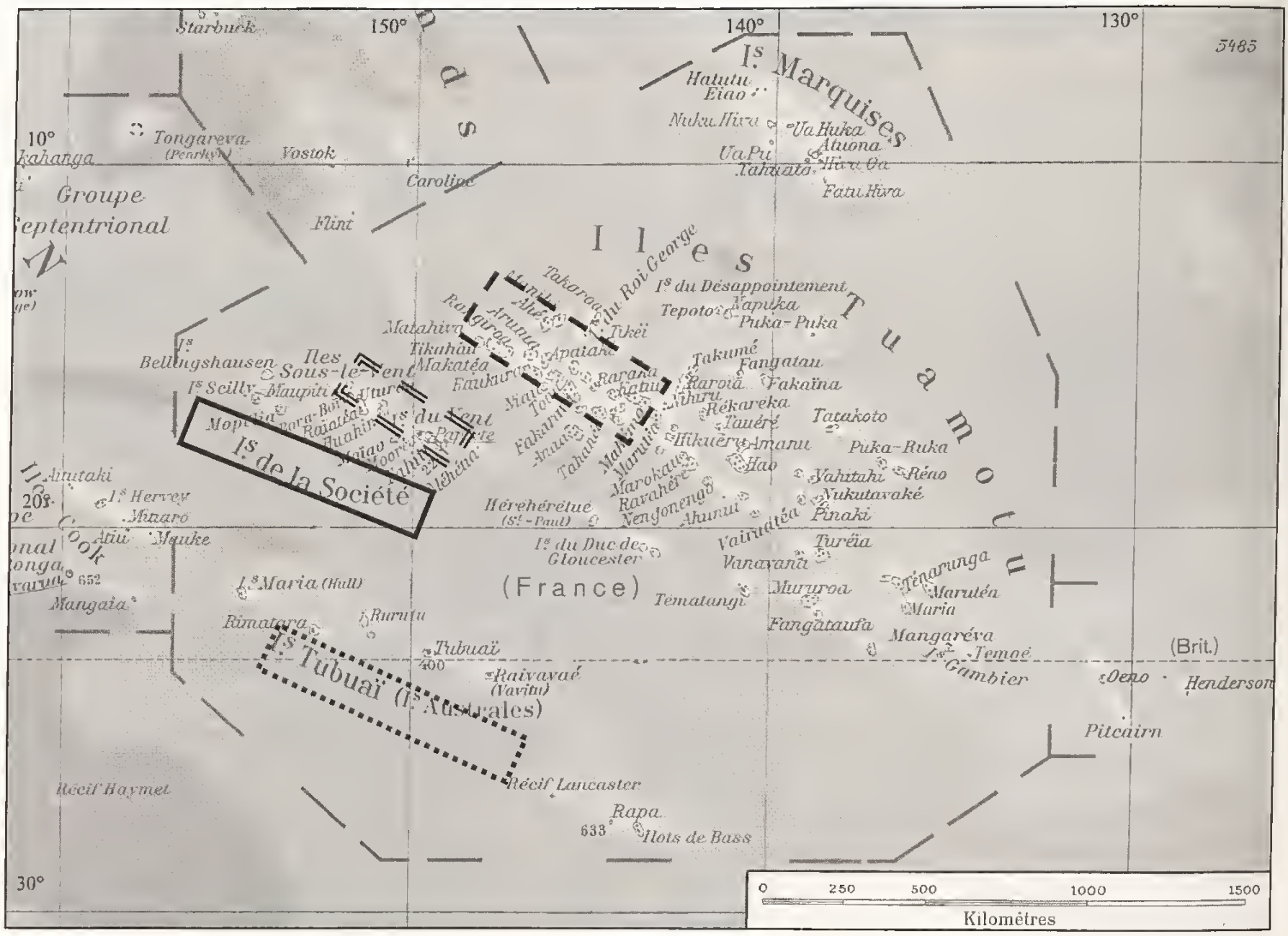
RESUME. De nouveaux relevés de huit espèces connues de Seguenzioidea and Trochoidea provenant de Polynésie Française sont listés, étendant ainsi l'aire de distribution d'un certain nombre d'entre elles. Sept nouvelles espèces sont décrites et comparées avec des espèces similaires : *Calliotropis ammos* n. sp., *Herpetopoma poichilum* n. sp., *Thalotia tiaraeides* n. sp., *T. khlimax* n. sp., *T. polysarchosa* n. sp., *Calliostoma (Fautor) lepton* n. sp., *Gaza polychoronos* n. sp.

INTRODUCTION

The deep-water fauna of the south-western Pacific is poorly known and not very documented. In the last decades occurred only a few books (Salvat & Rives, 1975; 1990) or papers (Cernohorsky, 1980; Tröndlé & Boutet, 2009; Vilvens, 2009b) about Polynesian shells; because some of these shells also occur in Hawaiian Islands, two recent books about Hawaiian malacofauna (Kay, 1979; Severn, 2011) can sometimes be useful. At the present time, one can mention that a team of malacologists (with J.Letourneux and R.Gourguet as contacts) is planning a compendium of the French Polynesian sea shells.
This explains the huge interest of deep-water material from French Polynesia brought recently in MNHN by the two campaigns BENTHAUS and TARASOC.
The BENTHAUS expedition was conducted in November 2002 aboard R.V. *Alis* by IRD (Institut de Recherche pour le Développement) with B. Richer de Forges as mission leader. It surveyed the Austral Islands from southwest to northeast (in an area covering 21°-29°S to 153°-140°W) from 60 to 1350 meters depth, with the aim to study the fauna living in these waters, especially zoo-benthos organisms like molluscs and crustaceans, and to perform seamounts cartography of this area. Dredging has been performed at 134 stations and trawling at 19 stations.

More recently, the TARASOC campaign was conducted in September and October 2009 aboard R.V. *Alis* by IRD and MNHN (Département Systématique & Evolution) with P. Bouchet as mission leader. The aim was to explore the fauna living on the benthos of Société Islands and the Tarava seamounts and to study the relations between isolation of these seamounts and their biodiversity, in partnership with MarBOL (Marine Barcode Of Life) project and CenSeam (Census of Marine Life on Seamounts) program. The Tarava Seamounts are 700 km long, are much older (about 35 to 50 million years) than Société seamounts and have some submarine summits reaching 600 to 900 m depth; they have been discovered in 1996 by the ZEPOLYF (Zone Economique de la Polynésie Française) program and no biological survey was ever undertaken in this area. During this campaign leaded in an area covering 15°-20°S to 155°-148°W, 213 dredging and trawling operations have been performed.

The present paper reports new records and new species of Seguenzioidea and Trochoidea species collected during these two campaigns.



Map 1 : Freneh Polynesia : global loeation of MNHN campaigns -

..... : BENTHAUS campaign;

——— : TARASOC campaign / leg 1 (1) : Tarava Seamounts;

— — — — — : TARASOC eampaign / leg 1 (2) : Tuamotu Archipelago;

═══ : TARASOC eampaign / leg 2 : Société Islands.

Material and methods

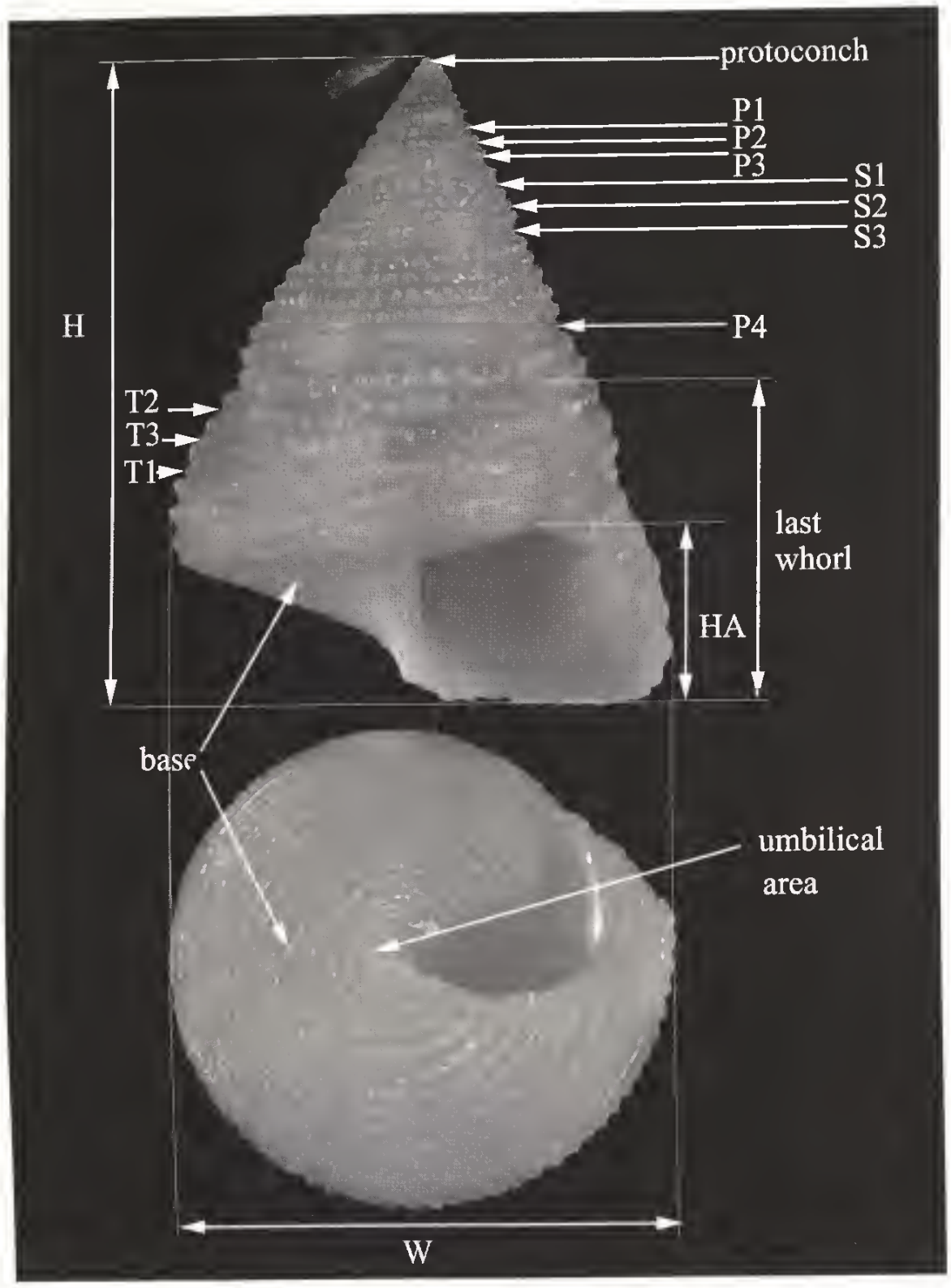
The material studied in the present paper was brought by the IRD-MNHN expeditions BENTHAUS (29/10/2002-28/11/2002) and TARASOC (20/09/2009–27/10/2009). Some information about intertidal and low subtidal speeies was brought by J.Letourneux and his team of Freneh Polynesian malaeologists.

Samples studied belong to superfamilies Trochoidea and Seguenziodea; the Solariellidae samples have been kept aside for another study using among other things DNA sequenees (Vilvens and Williams, in preparation).

Regarding the distribution of the new speeies and the extension of the distribution of known speeies, the range is taken from the internal intervals of the two extremes values. This range of the known and new species is provided for all the available specimens and also for the only living specimens if they have been found; when these ranges are the same, the common range is cited onee with the "(living)" annotation; if all the speeimens are dead eolleeted, the range is eited with the "(dead)" annotation.

Regarding the deseription methodology, the main conehological features used are (see Text Figure 1 below):

- general shape of the shell (depressed, high spired – eonieal, cyrtoeonoidal, coeloeonoidal);
- shape of the whorls (eonvex, eoneave, straight - with or without shoulder or keel);
- spiral cords of the whorls (ontogeny, number, beads, strength);
- spiral cords on the base (number, beads, distanee between);
- shape of the aperture, the outer and the inner lip.



Text Figure 1 : Features of shells; H : height; W : width; HA : height of the aperture; P1, P2, P3, ... : primary cords; S1, S2, S3, ... : secondary cords; T1, T2, ... : tertiary cords (shell : *Calliostoma (Fautor) chlorum* Vilvens, 2005, Fiji, BORDAU 1, stn DW1454, 13.6 x 10.4 mm).

Abbreviations

Repositories

MNHN : Muséum national d'Histoire naturelle, Paris, France.
NHMUK : Natural History Museum of United Kingdom, London, England.
NMP : National Museum of the Philippines, Manila, Philippines.

Other abbreviations

H : height
W : width
HA : height of the aperture
TW : number of teleoconch whorls
P1, P2, P3, ... : primary cords (P1 is the most adapical)
Pi : group of the primary cords (i=1,2,...)
S1, S2, S3, ... : secondary cords (S1 is the most adapical)
Si : group of the secondary cords (i=1,2,...)
T1, T2, T3, ... : tertiary cords (numbered following appearing order)
Ti : set of the tertiary cords (i=1,2,...)
stn : station
lv : live-taken specimens present in sample
dd : no live-taken specimens present in sample
sub : subadult specimen
juv : juvenile specimen
o.d. : original designation
s.d. : subsequent designation
p.c. : personal communication

SYSTEMATICS

I follow here the classification of Williams et al. (2008, 2010) where, among other things :

- Calliotropidae and Chilodontidae are ranked as families of superfamily Seguenzioidea, not subfamilies of Chilodontidae *sensu* Bouchet & Rocroi (2005);
- Calliostomatidae are ranked as a family of superfamily Trochoidea (besides true Trochidae and other families as Solariellidae), as did the first Marshall (1995a) who erected the group to the family level.

Superfamily **SEGUENZIOIDEA** Verrill, 1884
Family **CALLIOTROPIDAE** Hickman & McLean, 1990
Genus ***Calliotropis*** Seguenza, 1903
Type species: *Trochus ottoi* Philippi, 1844 (by o.d.) - Pliocene-Pleistocene, Italy.

Calliotropis oros marquisensis Vilvens, 2007
Figs 1-6

Calliotropis oros marquisensis Vilvens, 2007: 52, 223, figs 124-129. Type locality: Marquesas Islands, Hiva Oa Island, 500-525 m.

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3418, 16°33'S, 151°48'W, 580-618 m, 1 juv dd. – Stn CP3436, 16°43'S, 151°26'W, 430 m, 13 lv, 2 dd sub. – Stn CP3437, 16°41'S, 151°26'W, 440-560 m, 1 dd. – Stn CP3438, 16°41'S, 151°26'W, 638-700 m, 16 dd, 2 dd sub, 6 dd juv. – Stn CP3440, 16°40'S, 151°25'W, 650-800 m, 1 dd. – Stn DW3442, 16°41'S, 151°26'W, 515-550 m, 12 dd. – Stn DW3447, 16°42'S, 151°31'W, 620-700 m, 4 dd, 5 dd sub, 3 dd juv. – Stn DW3450, 16°40'S, 151°32'W, 705-755 m, 8 dd. – Stn DW3457, 16°45'S, 151°24'W, 520-572 m, 5 lv, 2 lv sub. – Stn DW3459, 17°28'S, 149°48'W, 485-560 m, 1 dd. – Stn DW3460, 17°28'S, 149°50'W, 660-680 m, 1 dd sub. – Stn DW3461, 17°27'S, 149°49'W, 844-877 m, 1 dd. – Stn DW3462, 17°27'S, 149°50'W, 1000-1145 m, 1 dd juv. – Stn DW3463, 17°34'S, 149°54'W, 460-505 m, 2 dd. – Stn DW3468, 17°34'S, 149°54'W, 800-870 m, 1 dd. – Stn DW3474, 17°28'S, 149°50'W, 720 m, 1 dd juv. – Stn DW3478, 17°31'S, 149°45'W, 678-810 m, 1 lv. – Stn DW3486, 17°48'S, 149°22'W, 660-920 m, 5 lv. – Stn DW3488, 17°48'S, 149°22'W, 390-790 m, 6 lv, 4 dd sub. – Stn DW3490, 17°48'S, 149°23'W, 720-1000 m, 2 lv. – Stn DW3494-3495, 17°27/28'S, 149°26/27'W, 556-859 m, 1 dd, 1 dd sub. – Stn DW3497, 17°43'S, 149°14'W, 365-850 m, 2 dd. – Stn DW3499, 17°41'S, 149°17'W, 550-700 m, 3 dd. – Stn DW3506, 17°36'S, 149°38'W, 380 m, 1 dd. – Stn without name, 300-900 m, 28 lv, 8 dd sub, 3 dd juv.

Distribution. French Polynesia, Marquesas Islands, alive in 500-660, shells in 408-1150 m (Vilvens, 2007); Société Islands, alive in 430-720, shells in 380-1000 m.

Calliotropis ammos n. sp.
Colour Figs A1-A2, Figs 7-13, Table 1

Type material. Holotype (22.4 x 22.7 mm) MNHN (24960). Paratypes: 5 MNHN (24961, 24962, 24963, 24964, 24965), 1 coll. C.Vilvens.

Type locality. Tuamotu Archipelago, Kaukura, TARASOC, stn DW3378, 15°38'S, 146°51'W, 887-890 m.

Material examined. French Polynesia, Tuamotu Archipelago. TARASOC: stn DW3349, 15°05'S, 148°03'W, 976-997 m, 1 dd sub. – Stn DW3362, 17°27'S, 149°50'W, 1000-1145 m, 1 dd sub. – Stn DW3374, 15°39'S, 146°54'W, 703-790 m, 1 lv (paratype), 1 dd juv. – Stn DW3377, 15°38'S, 146°53'W, 780-825 m, 2 dd (with paratype), 2 lv sub, 2 dd juv. – Stn DW3378, 15°38'S, 146°51'W, 887-890 m, 2 lv (holotype and paratype). – Stn DW3379, 15°38'S, 146°51'W, 800 m, 3 lv (with paratypes), 1 lv sub. – Stn DW3399, 15°51'S, 148°18'W, 1180-1308 m, 1 dd sub.
French Polynesia, Société Islands. TARASOC: stn DW3426, 16°41'S, 151°03'W, 801-874 m, 1 lv (paratype). – Stn DW3434, 16°42'S, 151°03'W, 700-785 m, 1 dd juv. – Stn DW3439, 16°43'S, 151°25'W, 800 m, 1 dd juv. – Stn DW3442, 16°41'S, 151°26'W, 515-550 m, 1 dd juv. – Stn DW3461, 17°27'S, 149°49'W, 844-877 m, 1 dd. – Stn DW3462, 17°27'S, 149°50'W, 1000-1145 m, 1 dd. – Stn DW3474, 17°28'S, 149°50'W, 720 m, 1 dd.

Distribution. French Polynesia, Tuamotu Archipelago, alive in 790-887 m, shells in 790-1180 m; Société Islands, alive in 801-874 m, shells in 550-1000 m.

Diagnosis. A rather big white *Calliotropis* species with a moderately elevated, more or less conical spire and a rounded periphery, 4 granular spiral cords on last whorls; size of beads of cords decreasing in size from adapical part to abapical part; convex base with 5 spiral cords; broad umbilicus covered by a deep-set septum.

Description. *Shell* of rather big size for the genus (height up to 24.5 mm, width up to 23.8 mm), more or less as high as wide, rather thin, conical; spire moderately elevated, height 0.9x to 1.1x width, 2.5x to 3.0x aperture height; broad umbilicus.
Protoconch of about 500-550 µm, of 1 whorl, dome shaped, without terminal varix.

Teleoconch up to 7.1 convex whorls, bearing 4 spiral granular cords different in size; nodules from cords produced on first whorls by intersections with axial ribs; axial sculpture on intermediate whorls consisting in prosocline threads in area between spiral cords; axial sculpture very weak on last whorls. Suture visible, not canaliculated.

First whorl convex, sculptured by 20-25 slightly prosocline smooth, rather strong ribs; interspace between ribs 2x broader than ribs; primary cord P2 and P3 appearing almost immediately; P2 weaker than P3. On second whorl, P2 and P3 stronger, beads of P3 sharp pointed. On third whorl, P1 appearing, weaker other cords; P2 closer to P1 than to P3; beads of P2 and P3 similar in size. On fourth whorl, P1 almost as strong as other cords; axial ribs enlarging, still strong; thin prosocline threads appearing between rib; P4 emerging partially from suture, beads smaller and more numerous than those of P2 and P3. On fifth whorl, axial ribs vanishing while axial threads still visible and even stronger; beads of P1, P2 and P3 bluntly pointed, similar in size, distance between about 1.5x size of bead; beads of P4 3x more numerous and much smaller than beads of other cords. On sixth whorl, number of beads of P3 increasing; axial threads weakening, but still visible. On last whorls, P4 peripheral; beads of spiral cords decreasing in strength and increasing in number (about 1.5x) from adapical to abapical cord; beads of P4 close together, about 2x more numerous and smaller than those of P1; prosocline threads almost obsolete.

Aperture subelliptic, vertically elongated; outer lip rather thin, flared at rim.

Columella more or less straight, strongly oblique, without tooth.

Base convex, with 5 spiral cords, outermost cords almost smooth, two innermost cords subgranular to granular; distance between outermost cords slightly greater than distance between the two innermost cords; axial ribs between spiral cords very weak, giving to interspaces a smooth appearance.

Umbilicus wide, diameter 27% to 33% of shell width, deep, funnel shaped, with gentle sloping walls, covered by a thin, deep-set thin septum; thin, weak axial threads inside; one thin, subgranular spiral cord possible under rim.

Colour of teleoconch yellowish sand; protoconch pinkish white.

	TW	H	W	HA	H/W	H/HA
holotype	6.9	22.4	22.7	8.5	0.99	2.64
paratype 1	7.0	22.7	22.3	8.7	1.02	2.61
paratype 2	7.1	24.5	23.8	9.9	1.03	2.47
paratype 3	6.7	22.7	21.6	7.5	1.05	3.03
paratype 4	7.1	24.1	23.7	8.6	1.02	2.80
paratype 5	6.7	22.4	23.7	8.8	0.95	2.55
paratype 6	6.9	22.4	21.4	8.8	1.05	2.55

Table 1. - *Calliotropis ammos* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *C. derbiosa* Vilvens, 2004 (Figs 14-15) from Vanuatu and Fiji, but this similar in size species has a smaller protoconch (about 200 µm), a more depressed spire (height always 0.9x width), a subangulate periphery, a stronger, persistent fine scale-like axial sculpture on the last whorls and on the base, a horizontally (not vertically) elongated aperture, 6 (not 5) granular, spiral cords on the base and no septum covering the umbilicus.

Etymology. Sand (Greek : αμμοζ), used as a noun in apposition - with reference to ground colour.

Family : **CHILODONTIDAE** Wenz, 1938

Preliminary comments. Following Jansen (1994), we consider that chilodontid species having axial sculpture as strong as spiral cords belong to *Euchelus* Philippi, 1847 while species with spiral cords stronger than axial ribs belong respectively to *Herpetopoma* Pilsbry, 1889 and to *Vaceuchelus* Iredale, 1929 when having a strong or a weak (if present) columellar tooth.

Genus: ***Herpetopoma*** Pilsbry, 1889

Type species: *Euchelus scabriusculus* A.Adams & Angas, 1867 (by o. d.) - Recent, Australia.

Herpetopoma corrugatum (Pease, 1861)
Figs 22-23

Euchelus corrugatus Pease, 1861: 435. Type locality: Sandwich Island.

Euchelus corrugatus – Kay, 1979: 49, fig 14-A.

Herpetopoma corrugatum – Severn, 2011: 44, pl. 6, fig 3.

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3416, 16°35'S, 151°44'W, 914 m, 2 dd. – Stn DW3420, 16°46'S, 151°04'W, 550 m, 1 dd. – Stn DW3429, 16°43'S,

150°38'W, 493-540 m, 2 dd. – Stn DW3434, 16°42'S, 151°03'W, 700-785 m, 1 dd sub. – Stn DW3481, 17°29'S, 149°45'W, 610 m, 1 dd, 2 dd juv.

Distribution. Hawaii, India, Marshall Islands, subtidal (Kay, 1979; Severn, 2011); French Polynesia, Société Islands, 540-914 m (dead); French Polynesia, Australes Archipelago, intertidal (living), 0-24 m (dead) (Letourneux et al., p.c.).

Herpetopoma poichilum n. sp.
Colour Figs G1-G2, Figs 16-19, Table 2

Type material. Holotype (3.1 x 2.5 mm) MNHN (24966). Paratypes: 4 MNHN (24967, 24968).

Type locality. Société Islands, Tahiti, TARASOC, stn DW3504, 17°37'S, 149°38'W, 455-650 m.

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3425, 16°43'S, 151°03'W, 557 m, 1 dd juv. – Stn DW3434, 16°42'S, 151°03'W, 700-785 m, 1 dd. – Stn DW3457, 16°45'S, 151°24'W, 520-572 m, 1 dd (paratype). – Stn DW3460, 17°28'S, 149°50'W, 660-680 m, 1 dd, 1 dd sub, 4 dd juv. – Stn DW3476, 17°29'S, 149°45'W, 435-490 m, 1 dd sub. – Stn DW3481, 17°29'S, 149°45'W, 610 m, 4 dd (with 3 paratypes), 3 dd juv. – Stn DW3484, 17°47'S, 149°23'W, 300-650 m, 1 dd juv. – Stn DW3498, 17°43'S, 149°17'W, 347-460 m, 3 dd. – Stn DW3504, 17°37'S, 149°38'W, 455-650 m, 1 lv (holotype).

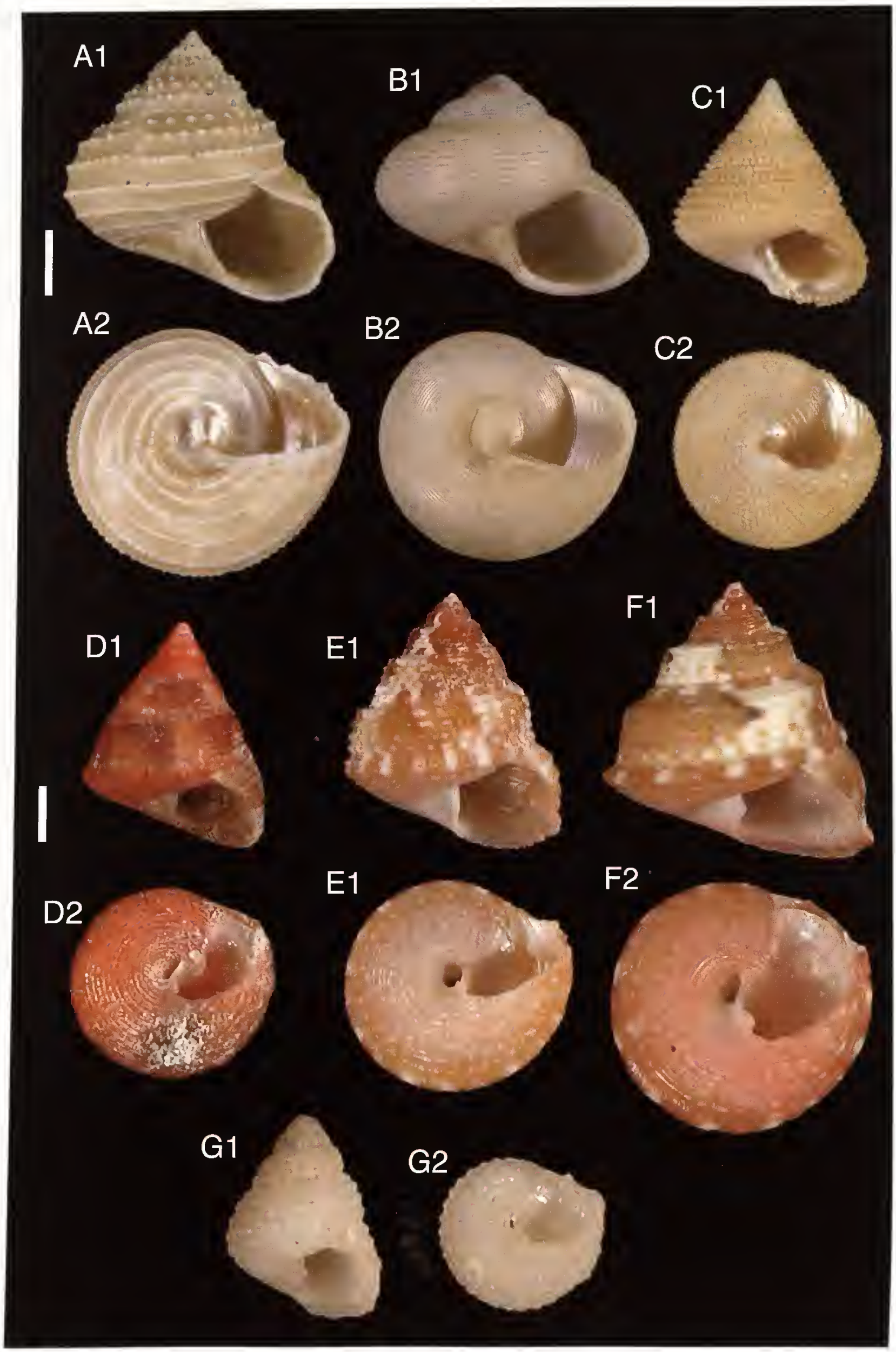
Distribution. French Polynesia, Société Islands, alive in 455-650 m, shells in 460-700 m.

Diagnosis. A small white *Herpetopoma* species with an elevated, more or less conical spire and a rounded periphery, 5 granular spiral cords on last whorl, peripheral cord smaller than the other cords, a convex base with 5 spiral cords and a closed or very narrow umbilicus.

Description. *Shell* of small size for the genus (height up to 4.8 mm, width up to 4.3 mm), higher than wide, rather thick, conical; spire elevated, height 1.1x to 1.2x width, 2.5x to 3.4x aperture height; umbilicus closed or reduced to a thin slit.
Protoconch more or less 200 µm, of about 1 whorl, with fine granules, with a thin terminal varix.
Teleoconch up to 5.1 convex whorls, bearing 5 spiral granular cords similar in size except peripheral smaller on last whorl; nodules from cords at intersections with strong axial prosocline ribs. Suture visible, weakly canaliculated.
First whorl convex, sculptured by about 20 slightly prosocline smooth, rather strong ribs; interspace between similar in size to ribs; primary cords P1, P2, P3 and P4 appearing at end of whorl, granular, closely packed, similar in size except P1 smaller. On second whorl, P3 slightly stronger than other cords, P1 still smaller; beads of all cords stronger, rounded, connected by axial ribs. On third whorl, all cords similar in size, except P1 smaller; distance between cords smaller than cords; strong axial ribs visible in interspaces, connecting beads of spiral cords. On fourth whorl, all cords more or less similar in size; axial ribs enlarging, still strong, more prosocline. On last whorl, P5 visible, slightly smaller than other cords; distance between cords still smaller than cords.
Aperture almost circular; outer lip thickened, with up to 9 inner lirae (eroded on dead specimens), lira the closest to columella stronger and producing a denticle.
Columella straight, almost vertical, with a basal tooth.
Base convex, with 5 subgranular to granular, similar in size spiral cords; distance between cords smaller than cords; axial ribs between spiral cords very visible.
Umbilicus close or reduced to a small chink.
Colour of teleoconch and protoconch white to yellowish white.

Colour plate 1. Holotypes MNHN of the new French Polynesian species described.

Scale bar: 5 mm.
A1-2. *Calliotropis ammos* n. sp., Tuamotu Archipelago, 887-890 m, 22.4 x 22.7 mm; **B1-2.** *Gaza polychoronos* n. sp., Société Islands, 580-618 m, 14.5 x 18.4 mm.
Scale bar: 1 mm.
C1-2. *Calliostoma (Fautor) lepton* n. sp., Tuamotu Archipelago, 315-340 m, 12.6 x 10.8 mm; **D1-2.** *Thalotia polysarchosa* n. sp., Australes Archipelago, 100 m, 4.5 x 4.0 mm; **E1-2.** *Thalotia khlimax* n. sp., Australes Archipelago, deep water, 6.2 x 5.1 mm, **F1-2.** *Thalotia tiaraeides* n. sp, Australes Archipelago, 500 800 m, 6.4 x 6.4 mm; **G1-2.** *Herpetopoma poichilum* n. sp, Société Islands, 455-650 m, 3.1 x 2.5 mm.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	TW	H	W	HA	H/W	H/HA
holotype	4.9	3.1	2.5	0.9	1.24	3.44
paratype 1	5.1	4.8	4.3	1.4	1.12	3.43
paratype 2	4.7	3.2	2.6	1.2	1.23	2.67
paratype 3	4.7	2.8	2.5	1.1	1.12	2.55
paratype 4	4.6	2.7	2.3	1.1	1.17	2.45

Table 2. - *Herpetopoma poichilum* n. sp.: Shells measurements in mm for types.

Discussion. The new species is rather close to *Herpetopoma eboreum* Vilvens & Héros, 2003 (Figs 20-21) from New Caledonia, but this slightly greater species lacks always an umbilicus, has a slightly cyrtoconoidal (not strictly conical) shape with only weakly convex to almost flat whorls, more close together spiral cords on the last whorls and up to 7 spiral cords on the base with interspace between cords as broad as cords.
Herpetopoma poichilum n. sp. is rather close to *H. elevata* Jansen, 1994 from Queensland, but this similar in size species has more convex whorls, four (not five), uneven in strength spiral cords on the last whorl with pointed (not rounded) nodules, four (not five) narrow spiral cords on the base.

Etymology. Embroidered (Greek :ποιχιλοζ) - with reference to the reticulate sculpture of the whorls.

Genus ***Vaceuchelus*** Iredale, 1929
Type species: *Euchelus angulatus* Pease, 1867 (by o.d.) – Recent, Indian Ocean.

Vaceuchelus foveolatus (A.Adams, 1853)
Figs 24-25

Monodonta foveolata A.Adams, 1853: 176. Type locality: Lord Hood's Island (=Marutea Atoll), 15-18 m.
Euchelus foveolatus – Pilsbry, 1889: 436.
Euchelus (Herpetopoma) foveolatus – Marshall, 1979: 524-525, figs 2A-E
"Euchelus" foveolatus – Kaieher, 1990: card#5790
Euchelus foveolatus – Herbert, 1996: 441, figs 72-73.
Vaceuchelus foveolatus – Poppe, Tagaro & Dekker, 2006: 48, pl. 16, fig 2.

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3390, 14°59'S, 148°18'W, 380-758 m, 1 dd. – Stn DW3481, 17°29'S, 149°45'W, 610 m, 1 dd juv. – Stn DW3498, 17°43'S, 149°17'W, 347-460 m, 1 dd sub.

Distribution. Fiji (Pilsbry, 1889 – depth unknown); Philippines, 4-100 (using Poppe et al., 2006 data); New Zealand, Raoul Is., 9-37 m (Marshall, 1979); French Polynesia, Tuamotu, 15-18 m (A.Adams, 1853); French Polynesia, Société Islands, intertidal (living), 0-610 m (dead) (using data of Letourneux et al., p.c.); French Polynesia, Australes Archipelago, intertidal (dead) (Letourneux et al., p.c.); French Polynesia, Tuamotu Archipelago, 0-100 m (dead) (Letourneux et al., p.c.); French Polynesia, Gambier Islands, 0-38 m (dead) (Letourneux et al., p.c.).

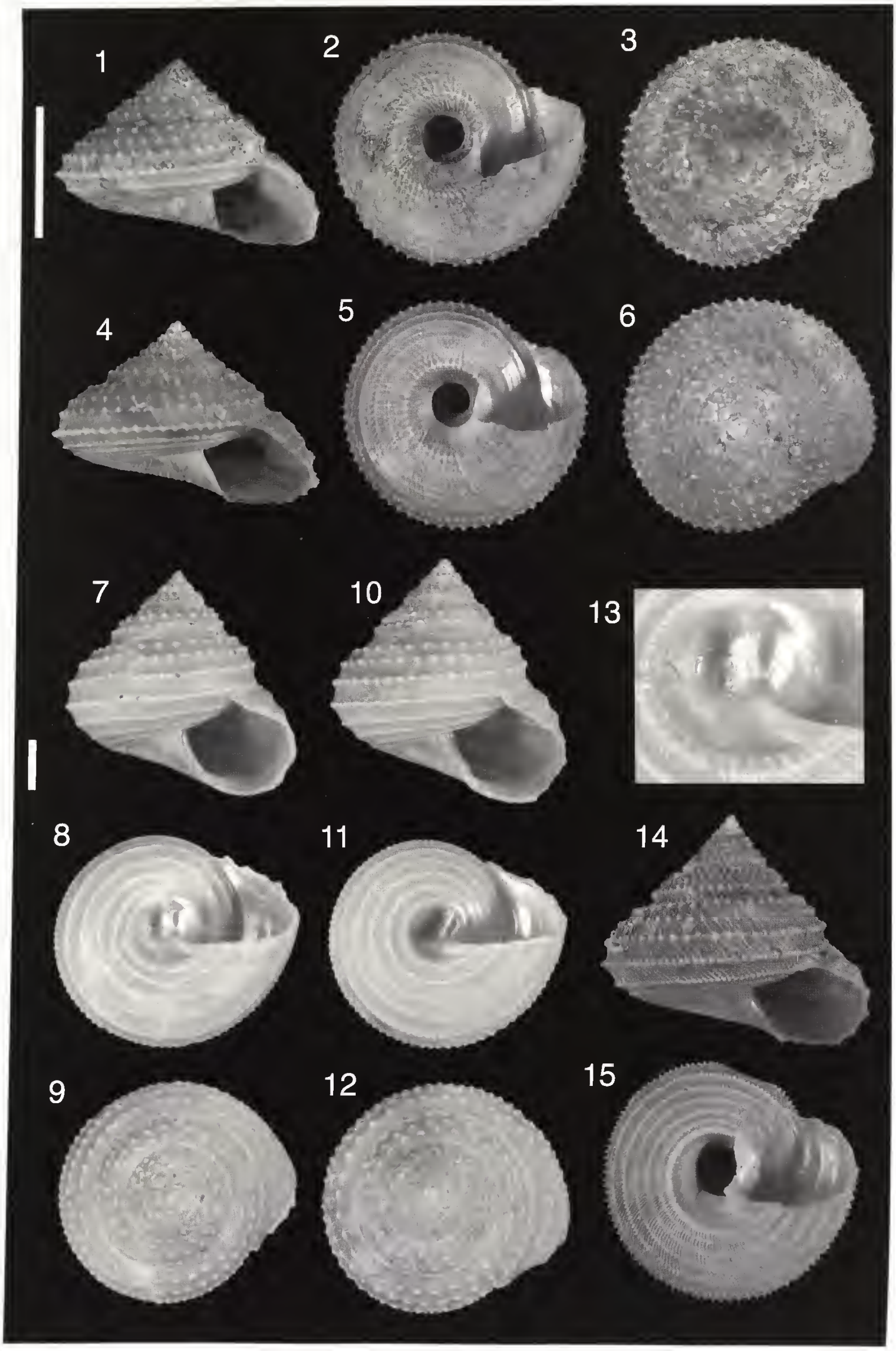
Vaceuchelus sp.
Figs 26-27

Material examined. French Polynesia, Tuamotu Archipelago. TARASOC: stn DW3349, 15°05'S, 148°03'W, 976-997 m, 1 dd.

Comments. This single specimen is too eroded seems different of every chilodontid known species, but its poor state could not lead to reliable description and comparison.

Genus: ***Agathodonta*** Cossman, 1918
Type species: *Trochus dentigerus* Orbigny, 1843 (by o. d.) – European Lower Cretaceous.

Figures 1-16. Scale bars = 5 mm
1-6. *Calliotropis oros marquisensis* Vilvens, 2007, Société Islands.; **1-3.** 300-900 m [TARASOC, stn DW3490], 8.4 x 11.9 mm; **4-6.** 720-1000 m [TARASOC, stn DW3490], 8.0 x 12.0 mm.
7-13. *Calliotropis ammos* n. sp., Tuamotu Archipelago.
7-9. Holotype MNHN (24960), 887-890 m [TARASOC, stn DW3378], 22.4 x 22.7 mm; **10-12.** Paratype MNHN (24964),800 m [TARASOC, stn DW3379], 24.1 x 23.7 mm; **13.** Details of septum on the umbilical area.
14-15. *Calliotropis derbiosa* Vilvens, 2004, holotype MNHN, Vanuatu, 748-775 m [MUSORSTOM 8, stn CP992], 22.3 x 25.4 mm.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Agathodonta sp.
Figs 28-30

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3499, 17°41'S, 149°17'W, 550-700 m, 1 dd.

Comments. This single specimen is so broken and and the whorls are so eroded that it is very difficult to give reliable a possible description and comparison with known species.

Superfamily **TROCHOIDEA** Rafinesque, 1815
Family **TROCHIDAE** Rafinesque, 1815
Subfamily **TROCHINAE** Rafinesque, 1815
Genus :***Trochus*** Linnaeus, 1758
Type species: *Trochus maculatus* Linnaeus, 1758 (by o. d.) - Recent, Indo-Pacific.

Trochus niloticus **Linnaeus, 1767**

Trochus niloticus Linnaeus, 1767: 1227, no. 579. Type locality : Indian Ocean.
Trochus niloticus – Cernohorsky, 1972: pp.38-39, pl.8, fig 1
Trochus niloticus – Salvat & Rives, 1975: 256,
Trochus niloticus – Kaicher, 1979: card#2175.
Trochus niloticus – Poppe, Tagaro & Dekker, 2006: 80-81, figs 70-71, pl. 33, figs 4-8.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1913, 27°02'S, 146°00'W, 120 m, 1 dd juv. – Stn DW1917, 27°03'S, 146°04'W, 50-60 m, 4 dd juv. – Stn DW2015, 22°38'S, 152°50'W, 250-280 m, 2 dd juv.

Distribution. Indo-Pacific, low subtidal; French Polynesia, Australes Archipelago, 60-250 m (dead juv).

Subfamily **CANTHARIDINAE** Gray, 1857

Preliminary comment. The discrimination between the various genera belonging to Cantharidinae (*sensu* Hickman & Mc Lean, 1990) is not very clear, especially using only conchological features (e.g. shape of the whorls, round aperture or with a vertical columella, angle between inner and outer lip, tooth on the columella or not, base with a gentle or a steep slope, umbilicus present or absent). The new species described here are placed into one of the existing genera, although some features don't fit exactly with the features of the chosen genus, because it seems useless to add to confusion by creating new genera.

Genus ***Cantharidus*** Montfort, 1810
Type species: *Trochus iris* Gmelin, 1791 (by o.d.) = *Limax opalus* Martyn, 1784 (by s.d., 1847) - Recent, New Zealand.

Cantharidus marmoreus (Pease, 1868)
Figs 31-32

Trochus marmoreus Pease, 1868: 287, pl.24 fig. 9. Type locality: Tuamotu Archipelago, Paumotus.
Cantharidus marmoreus – Cernohorsky, 1980: 113, figs 1-3.
Calliostoma marmoreum – Kaicher, 1979: card#2102.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1884, 27°54'S, 143°33'W, 570-620 m, 1 dd sub. – Stn DW1885, 27°52'S, 143°33'W, 700-800 m, 1 dd. – Stn DW1926, 24°38'S, 146°01'W, 50-90 m, 3 dd. – Stn DW1932, 24°41'S, 146°02'W, 500-800 m, 2 dd. – Stn DW1933, 24°41'S, 146°01'W, 500-850 m, 3 dd. – Stn DW1936, 24°40'S, 145°57'W, 80-100 m, 1 dd.

Distribution. French Polynesia, Tuamotu Archipelago, intertidal (dead) (Letourneux et al., p.c.); Australes Archipelago, 90-700 m (dead).

Cantharidus sp.
Figs 43-44

Material examined. Australes Archipelago. BENTHAUS: stn DW1939, 23°50'S, 147°42'W, 100 m, 1 dd.

Comments. This single specimen (7.3 x 5.6 mm) is highly eroded and has a broken protoconch : it is very difficult to describe accurately the spiral cords ontogeny.

Genus ***Jujubinus*** Monterosato, 1884
Type species: *Trochus matoni* Payraudeau, 1826 = *Trochus exasperatus* Pennant, 1777 (by s.d. Pilsbry, 1889)] - Recent, north-eastern Atlantic.

Jujubinus geographicus
Poppe, Tagaro & Dekker, 2006
Figs 39-42

Jujubinus geographicus Poppe, Tagaro & Dekker, 2006: 88-89, pl. 38, figs 2. Type locality : Philippines, Balicasag Is., 80-150 m.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1880, 27°55'S, 143°30'W, 90-94 m, 3 dd, 1 dd sub. – Stn DW1927, 24°39'S, 146°02'W, 95-105 m, 1 dd. – Stn DW1932, 24°41'S, 146°02'W, 500-800 m, 1 dd. – Stn DW1958, 23°20'S, 149°30'W, 80-150 m, 1 dd sub. – Stn DW2013, 22°39'S, 152°50'W, 80-93 m, 1 dd.

Distribution. Philippines, 80-150 m (Poppe et al., 2006); French Polynesia, Australes Archipelago, 93-500 m (dead); French Polynesia, Tuamotu Archipelago, 0-100 m (dead) (Letourneux et al., p.c.); French Polynesia, Société Islands, 0-85 m (dead) (Letourneux et al., p.c.).

Comments. Regarding the huge gap between the type locality (Philippines) and French Polynesia, one can wonder to find this species in Australes Archipelago stations. But no clear conchological distinctions ean be made between samples from the two areas, except that some Polynesian shells are less elevated, the subsutural spiral cord can be divided into two cords on the last whorls and the colour of the whorls is orange based rather then red wine.

Genus ***Thalotia*** Gray, 1847
Type species: *Monodonta conica* Gray, 1827 [=*Trochus pictus* Wood, 1828] (by o.d.) - Recent, Southern Australia.

Thalotia tiaraeides n. sp.
Colour Figs F1-F2, Figs 33-34, Table 3

Type material. Holotype (6.4 x 6.4 mm) MNHN (24969). Paratypes: 3 MNHN (24970, 24971).

Type locality. French Polynesia, Australes Archipelago, Président Thiers Bank, BENTHAUS, stn DW1932, 24°41'S, 146°02'W, 500 800 m.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1923, 27°01'S, 146°05'W, 360-840 m, 1 dd. – Stn DW1932, 24°41'S, 146°02'W, 500-800 m, 1 dd (holotype). – Stn DW1955, 23°19'S, 149°26'W, 750-850 m, 1 dd sub. – Stn DW1958, 23°20'S, 149°30'W, 80-150 m, 1 dd sub. – Stn DW1999, 22°25'S, 151°22'W, 270-500 m, 1 dd. – Stn DW2003, 22°28'S, 151°19'W, 250-330 m, 1 dd (paratype). – Stn DW2018, 22°37'S, 152°49'W, 770-771 m, 1 dd. – Stn DW2020, 22°37'S, 151°49'W, 920-930 m, 2 dd (paratypes).

Distribution. French Polynesia, Australes Archipelago, 150-920 m (dead).

Diagnosis. A small white Cantharidinae species with a moderately elevated spire, a subsutural angulate keel making shoulder and a thick peripheral keel; 6 main granular spiral cords on last whorl with a thick peripheral keel; slightly convex base with up to 10 low, nearly smooth spiral cords; narrow and deep umbilicus, partly covered by a columellar expansion.

Description. *Shell* of small size for the genus (height up to 6.6 mm, width up to 6.4 mm), as high as wide or slightly higher than wide, rather thick, conical with a subsutural angulate keel making shoulder with gentle slope; spire moderately elevated, height 0.9x to 1.2x width, 3.3x to 3.6x aperture height; umbilicus narrow and deep, partly covered by a columellar expansion.
Protoconch approximately about 200 µm (eroded or damaged on all samples), without visible varix.
Teleoconch up to 6.1 convex whorls, bearing 6 main, similar in size spiral granular cords and peripheral keel produced by three close thin spiral cords. Suture visible, not canaliculated.
First whorl convex, sculptured by 4 smooth primary spiral cords and weak, low, wide axial folds; P1, P2 and P3 similar in size and evenly pinkish coloured, abapical cord P4 thinner with regular orange dashes; distance between P3 and P4 greater than distance between other cords. On second whorl, axial folds thinner and making P1, P2 and P3 subgranular. On third whorl, axial sculpture weakening; shoulder appearing with a round keel made by P1 at first adapical quarter; P1 stronger than other cords; S2 appearing rather quickly as strong as P2 and P3; strong suprasutural angulation above P4. On fourth whorl, keel much more angulate; S3 appearing above suprasutural angulation, quickly as strong as P3; T1 appearing at end of whorl on shoulder between suture and P1, quickly as strong as P2 but weaker than P1; T2 appearing between suprasutural angulation and P4, both cords thinner than other cords; all spiral cords granular. On fifth whorl, S3 stronger than P3, S2 and P2; T3 appearing between angulation and T2, similar in size to T2 and P4; beads of cords prosoclinely elongated. On last whorl, additional Ti appearing by intercalation; P4, T2 and T3 very close, hard to distinguish and forming a thick peripheral keel.
Aperture subquadrangular, slightly transversally elongated; outer lip thickened inside, meeting inner lip with obtuse angle.
Columella straight, almost vertical, with a strong tooth at abapical third.
Base weakly convex to almost flat, with 8-10 smooth to subgranular, similar in size spiral cords; distance between cords smaller than cords.
Umbilicus fairly narrow (diameter about 9% of shell width) and deep, funnel shaped with thin axial ridges inside, partly covered by columellar expansion.
Colour of protoconch and teleoconch first whorl deep pink; next whorls orange brown with wide, irregular axial white patches; spiral cords of three last whorls alternating pinkish white and orange dashes; umbilical area and inner part of base light pink, spiral cords of outer part alternating orange and pink.

	TW	H	W	HA	H/W	H/HA
holotype	6.1	6.4	6.4	1.8	1.00	3.56
paratype 1	5.8	5.9	6.4	1.8	0.92	3.28
paratype 2	6.1	6.2	5.8	1.8	1.07	3.44
paratype 3	5.7	6.6	5.5	1.9	1.20	3.47

Table 3. - *Thalotia tiaraeides* n. sp.: Shells measurements in mm for types.

Discussion. Regarding the straight, vertical columella, the rather sharp basal columellar tooth, the obtuse angle between inner and outer lip and the narrow umbilicus, and taking in account the shape of the new species similar to the one of *Thalotia* (*Odontotrochus*) *chlorostoma* (Menke, 1843) (despite a very different size), the genus *Thalotia* (as commented by Wilson, 1993) seems the more appropriate for this new species.
The new species is rather close to *Jujubinus hubrechti* Poppe, Tagaro & Dekker, 2006 (figs 35-36) from Philippines, but this similar in size species has a more elevated spire, a much stronger adapical spiral cord on the shoulder with elongate beads, a much stronger peripheral spiral cord with stronger, much rounded beads and different colours (green background colour instead orange brown).

Etymology. Tiara shaped (Greek : τιαρα and ειδηζ), adjective agreeing with a neutral noun - with reference to the general shape of the shell reminding an ancient tiara.

Thalotia khlimax n. sp.
Colour Figs E1-E2, Figs 37-38

Type material. Holotype (6.2 x 5.1 mm) MNHN (24972). Paratype (5.4 x 4.7 mm) MNHN (24973).

Type locality. French Polynesia, Australes Archipelago, BENTHAUS, stn without data.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1885, 27°52'S, 143°33'W, 700-800 m, 1 dd. – Stn DW1903, 27°27'S, 144°04'W, 400-800 m, 1 dd sub. – Stn DW1923, 27°01'S, 146°05'W, 360-840 m, 1 dd (paratype). – Stn DW1961, 23°21'S, 149°34'W, 470-800 m, 1 dd. – Stn with no data, 1 lv (holotype), 1 dd sub.

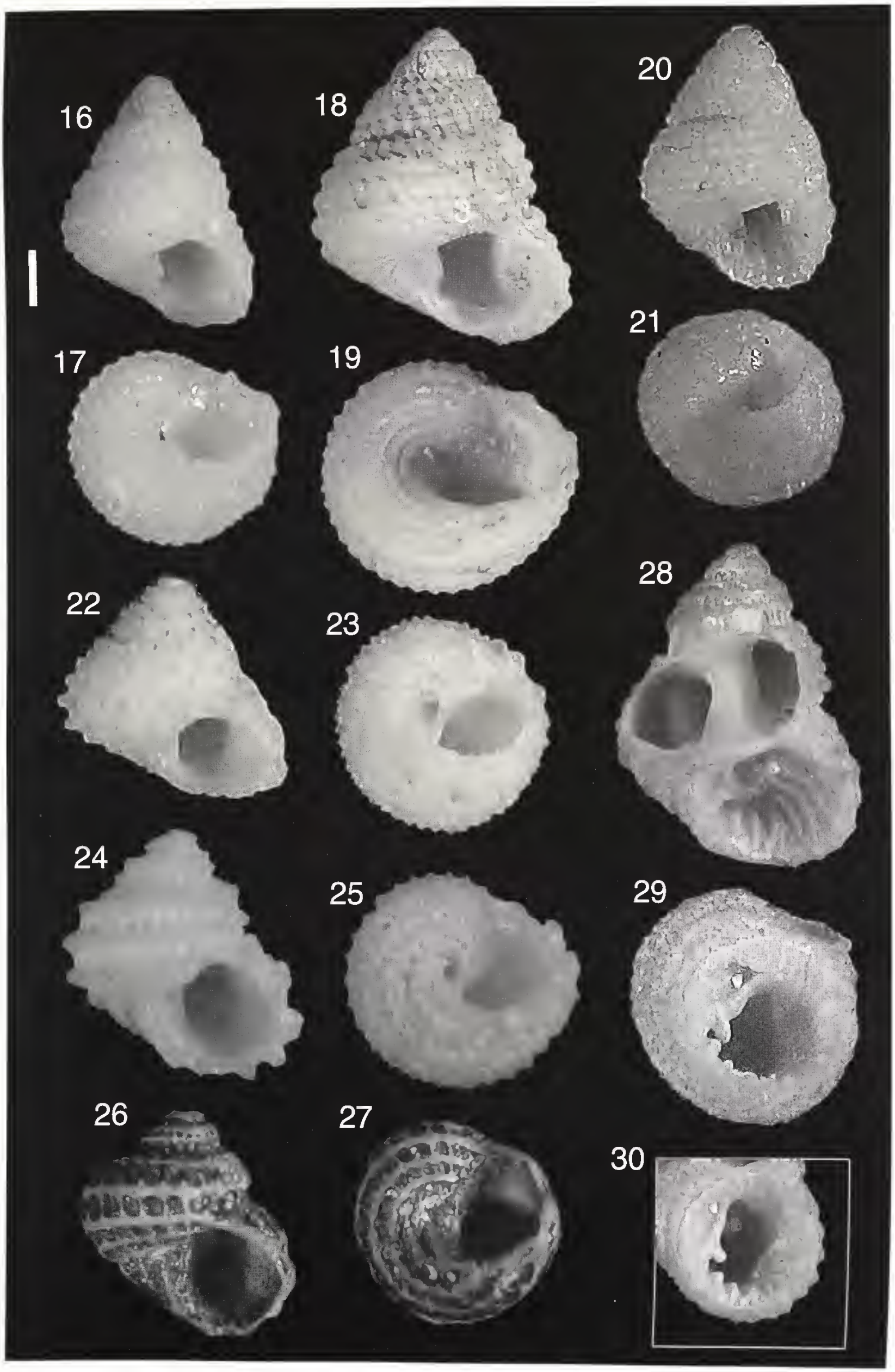
Distribution. French Polynesia, Australes Archipelago, 700-800 (dead).

Diagnosis. A small white Cantharidinae species with a moderately elevated spire and a small subsutural angulate keel making shoulder; 7 main granular spiral cords on last whorl, the two abapical cords slightly thinner, closer and separated from the other cords by a weakly concave area; slightly convex base with up to 10 low, smooth to subgranular spiral cords; moderately wide, deep umbilicus.

Description. *Shell* of small size for the genus (height up to 6.2 mm, width up to 5.1 mm), higher than wide, rather thin, conical with a small subsutural angulate keel making shoulder with gentle to almost horizontal slope; spire moderately elevated, height 1.1x to 1.2x width, 2.8x to 3.9x aperture height; umbilicus narrow and deep.
Protoconch about 100 µm, exserted, without visible varix.
Teleoconch up to 6.1 convex whorls, bearing 7 spiral granular cords; 5 adapical cords similar in size and 2 thinner, close peripheral cords with a concave area between two groups. Suture not canaliculated, poorly visible.
First whorl convex, sculptured by 3 primary spiral cords P2, P3 and P4 similar in size and evenly pinkish coloured; P1 appearing at mid whorl, similar to other cords. On second whorl, all cords subgranular; P1, P2 and P3 thicker, P4 thinner; shoulder appearing with a round keel made by P2 at first adapical quarter; distance between P3 and P4 greater than distance between other cords; S4 appearing at end of whorl, similar in size and shape to P4. On third whorl, S3 appearing, quickly as strong as P3; additional T1 appearing at mid whorl on shoulder between suture and P1. On fourth whorl, P1 thickening; keel more angulate and moving adapically to P1; T1 similar in size to P1; all spiral cords granular; distance between S3 and P4 still greater than distance between other cords, distance between P4 and S4 smaller than distance between other cords. On last whorls, T2 appearing between T1 and P1, similar in size to T1; beads of all cords rounded, without interspaces between; distance between P1, P2, P3 and S3 similar to cords; no interspace between P4 and S4; area between S3 and P4 concave, wider than cords, with prosocline, racher thick threads.

Figures 16-30. Scale bars = 1 mm except scale figs 18-19 = 100 µm.

16-19. *Herpetopoma poichilum* n. sp, Société Islands. **16-17.** Holotype MNHN (24966), 455-650 m [TARASOC, stn DW3504], 3.1 x 2.5 mm; **18-19.** Paratype MNHN (24967), 520-572 m m [TARASOC, stn DW3457], 4.8 x 4.3 mm.
20-21. *Herpetopoma eboreum* Vilvens & Héros, 2003, Caledonia, Touho area, 50–62 m [MONTROUZIER, stn 1275], 4.0 x 2.8 mm.
22-23. *Herpetopoma corrugatum* (Pease, 1861), Société Islands, 493-540 m [TARASOC, stn DW3429], 3.0 x 2.9 mm.
24-25. *Vaceuchelus foveolatus* (A.Adams, 1851), Société Islands, 380-758 m [TARASOC, stn DW3390], 3.6 x 3.5 mm.
26-27. *Vaceuchelus* sp., Tuamotu Archipelago, 976-997 m [TARASOC, stn DW3349], 3.2 x 3.3 mm.
28-30. *Agathodonta* sp., Société Islands, 550-700 m [TARASOC, stn DW3499], 5.0 x 4.0 mm.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Aperture subcircular; outer lip with a weak peripheral angulation and meeting inner lip with obtuse angle.
Columella straight, almost vertical, with weak swelling (holotype) or blunt tooth (paratype) at abapical third.
Base weakly convex to almost flat, with 10 smooth to subgranular, similar in size spiral cords; distance between cords smaller than cords.
Umbilicus moderately wide (diameter about 15% of shell width) and deep, funnel shaped with thin axial ridges inside.
Colour of protoconch pinkish white; teleoconch first whorl pinkish mauve; next whorls orange brown with irregular axial white and pink patches; periphery alternating orange dashes and narrower axial pinkish white flames; umbilical area and inner part of base nacreous pink, spiral cords of outer part alternating orange and pink.

Discussion. For the same reason as for *Thalotia tiaraeides* n. sp., the genus *Thalotia* seems the more appropriate for this new species.
Thalotia khlimax n.sp. may be compared to *T. tiaraeides* n. sp., but this similar in size species has a wider shoulder, a thick peripheral keel and an umbilicus partly covered by a columellar expansion.
The new species may be compared to *Kanekotrochus vietnamensis* Dekker, 2006 from Vietnam, but this species is much greater (height about 15 mm) for a same number of whorls, a more depressed spire and no umbilicus.

Etymology. Staircase (Greek : χλιμαξ) – with reference to the staggered shape of the shell.

Thalotia polysarchosa n. sp.
Colour Figs D1-D2, Figs 45-50, Table 4

Type material. Holotype (4.5 x 4.0 mm) MNHN (24974). Paratypes : 3 MNHN (24975).

Type locality. Australes Archipelago, BENTHAUS, stn DW1894, 27°40'S, 144°22'W, 100 m.

Material examined. French Polynesia, Australes Archipelago. BENTHAUS: stn DW1894, 27°40'S, 144°22'W, 100 m, 6 dd (holotype and paratypes), 1 dd sub. – Stn DW1939, 23°50'S, 147°42'W, 100 m, 1 dd, 2 dd sub. – Stn DW1946, 23°49'S, 147°41'W, 100-200 m, 1 dd. – Stn DW2018, 22°37'S, 152°49'W, 770-771 m, 4 dd.
French Polynesia, Société Islands. TARASOC: stn DW3420, 16°46'S, 151°04'W, 550 m, 1 dd juv. – Stn DW3429, 16°43'S, 150°38'W, 493-540 m, 2 dd juv. – Stn DW3434, 16°42'S, 151°03'W, 700-785 m, 1 dd juv. – Stn DW3435, 16°41'S, 151°02'W, 500-612 m, 5 dd juv. – Stn DW3451, 16°53'S, 151°21'W, 440-490 m, 1 dd juv. – Stn DW3458, 16°46'S, 151°23'W, 573-611 m, 1 dd. – Stn DW3459, 17°28'S, 149°48'W, 485-560 m, 1 dd sub, 3 dd juv. – Stn DW3460, 17°28'S, 149°50'W, 660-680 m, 4 dd juv. – Stn DW3476, 17°29'S, 149°45'W, 435-490 m, 7 dd sub. – Stn DW3481, 17°29'S, 149°45'W, 610 m, 7 dd juv. – Stn DW3482, 17°29'S, 149°45'W, 440 m, 2 dd.

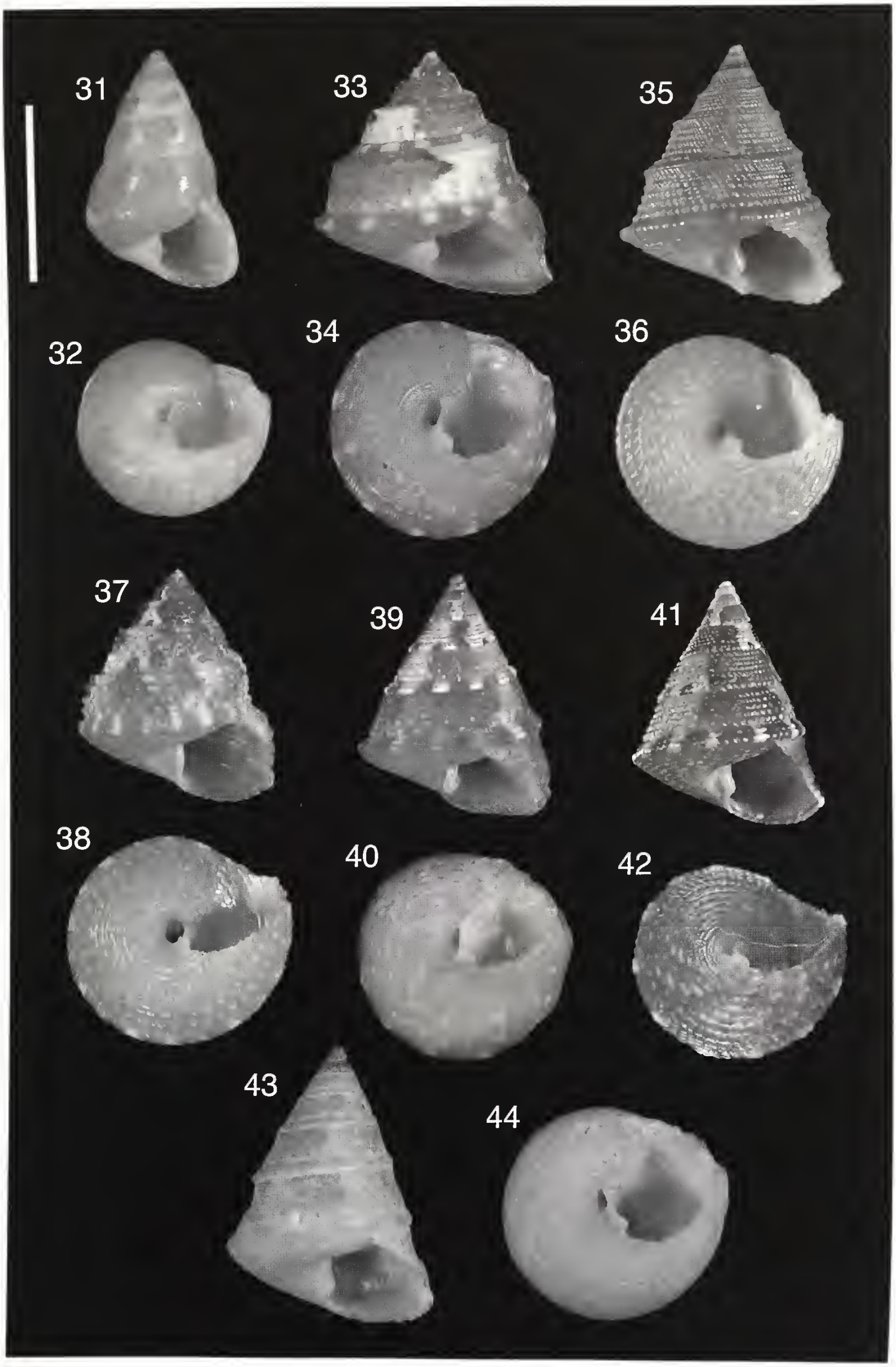
Distribution. French Polynesia, Australes Archipelago, 100-770 m (dead); Société Islands, 440-700 m (dead).

Diagnosis. A small reddish or orange brown Cantharidinae species with a moderately elevated spire with a weak suprasutural angulation; 8 main granular spiral cords on last whorl, the two abapical cords roundly granular, the median cords nearly smooth and the subsutural cords granular with axially elongated beads; base moderately convex with about 12 low, smooth cords; moderately wide, deep umbilicus partly covered by a columellar expansion.

Description. *Shell* of small size for the genus (height up to 4.6 mm, width up to 4.0 mm), higher than wide, rather thin, weakly cyrtoconoidal with an angular periphery; spire moderately elevated, height 1.1x to 1.2x width, 2.8x to 3.8x aperture height; umbilicus moderately wide and deep.
Protoconch about 100-120 µm, exserted, with a thin varix.

Figures 31-44. Scale bars = 5 mm.

31-32. *Cantharidus marmoreus* (Pease, 1868), Australes Archipelago, 700-800 m [BENTHAUS, DW1885], 6.5 x 4.1 mm;
33-34. *Thalotia tiaraeides* n. sp, holotype MNHN (24969), Australes Archipelago, 500-800 m [BENTHAUS, stn DW1932], 6.4 x 6.4 mm.
35-36. *Jujubinus hubrechti* Poppe, Tagaro & Dekker, 2006, holotype NMP, Philippines, Balicasag, 80-150 m, 7.0 x 6.2 mm – Photographs courtesy of Conchology, Inc.
37-38. *Thalotia khlimax* n. sp., holotype MNHN (24972), Australes Archipelago [BENTHAUS, stn with no data], 6.2 x 5.1 mm.
39-42. *Jujubinus geographicus* Poppe, Tagaro & Dekker, 2006. **39-40.** Australes Archipelago, 95-105 m [BENTHAUS: stn DW1927], 5.3 x 4.1 mm; **41-42.** Holotype NMP, Philippines, Mactan Island, 80-150 m, 4.9 x 3.8 mm - Photographs courtesy of Conchology, Inc.
43-44. *Cantharidus* sp., Australes Archipelago, 100 m [BENTHAUS: stn DW1939], 7.3 x 5.6 mm.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Teleoconch up to 6.2 convex whorls, bearing 8 spiral granular cords, in two areas of 6 and 2 cords, separated by a weak angulation; most adapical and two most adapical cords granular, other cords nearly smooth. Suture not canaliculated, poorly visible.

First whorl convex, sculptured by 4 primary spiral cords poorly marked, more or less similar in size. On second whorl, spiral cords wider, very low, distance between cords much smaller than cords; P4 slightly stronger, weakly subgranular; other cords smooth; S3 appearing at end of whorl. On third whorl, angulation appearing between S3 and P4; S3 quickly similar to P3.

On fourth whorl, all cords more elevated; S2 appearing at begin of whorl, quickly similar to P2; P4 dividing into two cords, subgranular at mid whorl, adapical cord slightly thinner; distance between S3 and two abapical cords greater than distance between other cords; S1 appearing at end of whorl by separation from P1. On fifth whorl, P1 and S1 weakly subgranular; two P4 clearly granular with round beads. On last whorls, four adapical cords granular with prosocline elongated beads; P3 and S3 still nearly smooth; two P4 roundly granular, similar in size, producing a week peripheral keel; T1 appearing under S3; T2 possibly appearing between two P4 on large specimens.

Aperture subelliptic, slightly prosoclinely elongated on large specimens; outer lip with a weak peripheral angulation and meeting inner lip with obtuse angle.

Columella straight, slightly opisthocline to vertical, with one blunt tooth at abapical third.

Base moderately convex, with 12 nearly smooth spiral cords; distance between cords smaller than cords; size of cords decreasing from outer part of base to inner part.

Umbilicus moderately wide (diameter about 15-16% of shell width) and deep, partly covered by expansion of columella, funnel shaped with thin axial ridges inside.

Colour of protoconch pinkish white to deep pink; teleoconch colour pattern rather variable : ground colour reddish brown to orange brown or pinkish brown, irregular axial white, light brown or pinkish patches; periphery alternating orange and pinkish white dashes; umbilical area and inner half of base nacreous pink or light red, spiral cords of outer half alternating pink and red or orange and pink, or almost uniformly pink.

	TW	H	W	HA	H/W	H/HA
holotype	6.2	4.5	4.0	1.3	1.13	3.46
paratype 1	6.0	3.7	3.2	1.3	1.16	2.85
paratype 2	6.0	4.6	3.8	1.2	1.21	3.83
paratype 3	5.9	3.9	3.3	1.1	1.18	3.55

Table 4. - *Thalotia polysarchosa* n. sp. : Shells measurements in mm for types.

Discussion. Regarding its small size (the well formed columellar tooth implies that the studied specimens are, at least, shells of young adults) and the general shape of its shell, the new species can only be compared to similar in size known species from Philippines or French Polynesia. Among them, *Thalotia polysarchosa* n. sp. is rather close to *Jujubinus geographicus* Poppe, Tagaro & Dekker, 2006 (Figs 35-36) from Philippines and French Polynesia (new record in this paper), but this similar in size species is slightly more elevated, has a more conical shape, 7 (not 8) main granular spiral cords all with rounded beads, a more pronounced suprasutural keel and a subcircular aperture without transversal elongation.

Etymology. Obese (Greek : πολυσαρχοζ), with reference to the cyrtoconoidal shape of the moderately elevated shell.

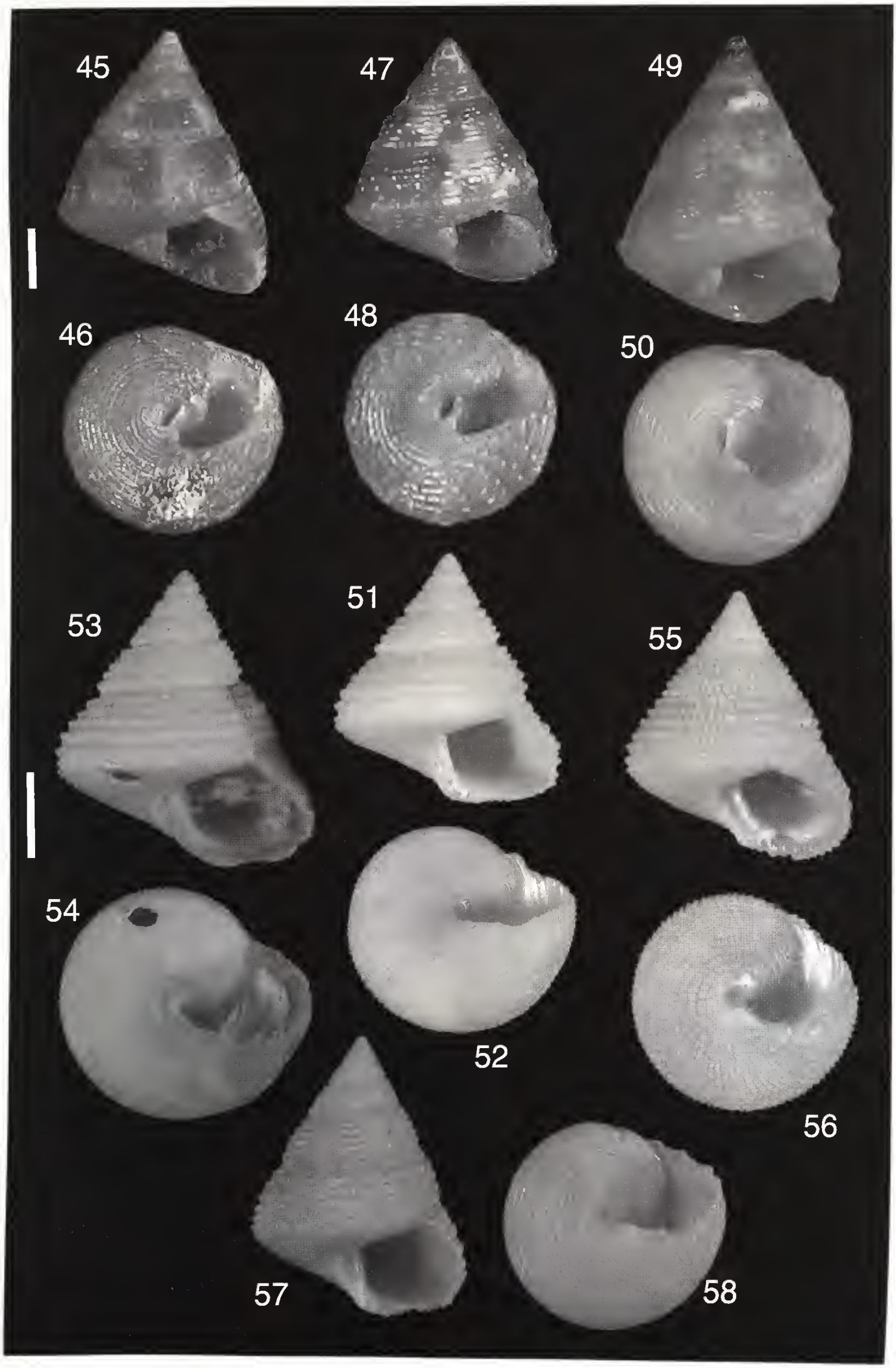
Figures 45-58. 1st scale bar = 1 mm, 2nd scale bar = 5 mm.

45-50. *Thalotia polysarchosa* n. sp. **45-48.** Australes Archipelago, 100 m [BENTHAUS, stn DW1894]; **45-46.** Holotype MNHN (24974), 4.5 x 4.0 mm. **47-48.** Paratype MNHN (24975), 3.7 x 3.2 mm; **49-50.** Société Islands, 440 m [TARASOC, stn DW3482], 5.2 x 4.1 mm.

51-54. *Calliostoma (Fautor) paradigmatum* Marshall, 1995. **51-52.** Tarava Seamounts, 670-757 m [BENTHAUS, stn DW3300], 10.9 x 10.1 mm; **53-54.** Southern New Calcdonia, 650-730 m [BATHUS 3, stn DW809], 17.6 x 15.2 mm.

55-56. *Calliostoma (Fautor) lepton* n. sp., holotype MNHN (24976), Tuamotu Archipelago, 315-340 m [TARASOC, stn DW3370], 12.6 x 10.8 mm.

57-58. *Calliostoma (Fautor) necopinatum* Marshall, 1995, paratype MNHN, New Caledonia, Atoll de Surprise, 255 m [MUSORSTOM 4, stn DW164], 12.7 x 9.8 mm.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Genus ***Calliotrochus*** Fischer, 1879
Type species: *Turbo phasianellus* Deshayes, 1863 (by monotypy) = *Margarita marmorea* Pease, 1861 - Recent, Indo-Pacific.

Calliotrochus marmoreus (Pease, 1861)

Margarita marmorea Pease, 1861: 435. Type locality: Sandwich Islands.
Turbo phasianellus – Deshayes, 1863: 74, n°216.
Gibbula marmorea – Kay, 1979: 51, fig 14-E.
Calliotrochus marmoreus – Severn, 2011: 48, pl. 8, fig 1.

Material examined. French Polynesia, Tarava Seamounts. TARASOC: stn DW3302, 19°15'S, 150°57'W, 600-660 m, 9 dd, 2 dd juv. – Stn DW3316, 19°14'S, 151°33'W, 519-520 m, 5 dd juv. – Stn DW3318, 19°15'S, 151°31'W, 557-569 m, 1 dd juv. – Stn DW3333, 18°45'S, 152°18'W, 795-975 m, 1 dd juv. – Stn DW3336, 18°23'S, 154°06'W, 573-619 m, 9 dd. – Stn DW3337, 18°23'S, 154°05'W, 571-614 m, 1 dd juv.
French Polynesia, Tuamotu Archipelago. TARASOC: stn DW3349, 15°05'S, 148°03'W, 976-997 m, 1 dd juv.
French Polynesia, Société Islands. TARASOC: stn DW3420, 16°46'S, 151°04'W, 550 m, 1 dd juv.

Distribution. Indo-Pacific (from northern Zululand to Hawaii and French Polynesia), shallow waters (Herbert, 1998); Hawaiian Islands, intertidal (Severn, 2011); French Polynesia, Tarava Seamounts, 520-795 m (dead); French Polynesia, Tuamotu Archipelago, 976-997 m (dead); French Polynesia, Société Islands, intertidal (living), 10-550 m (dead) (using data from Letourneux et al., p.c.).

Family **CALLIOSTOMATIDAE** Thiele, 1924
Subfamily **CALLIOSTOMATINAE** Thiele, 1924
Genus ***Calliostoma*** Swainson, 1840
Subgenus ***Fautor*** Iredale, 1924
Type species : *Ziziphinus comptus* A.Adams, 1855 (by o.d.) – Recent, southern Australia.

Calliostoma (Fautor) paradigmatum Marshall, 1995
Figs 51-54

Calliostoma (Fautor) paradigmatum Marshall, 1995b: 395-397, figs 13-15, 119, 155. Type locality: Southern New Caledonia, 505-550 m.
Calliostoma (Fautor) paradigmatum – Vilvens, 2005: 2.
Calliostoma (Fautor) paradigmatum – Vilvens, 2009a: 132, figs 25-26.

Material examined. Tarava Seamounts. BENTHAUS: stn DW3300, 19°19'S, 151°00'W, 670-757 m, 1 dd. – Stn DW3302, 19°15'S, 150°57'W, 600-660 m, 2 dd juv.

Distribution. Off Ile Surprise, northern New Caledonia, 585 m (living); South of Ile des Pins, southern New Caledonia, northern Norfolk Ridge, 470-795 m, living at 550-795 m (range computed using data of Marshall, 1995); Tonga, 342-500 m (dead); Tarava Seamounts, 660-670 m (dead).

Comments. Regarding the huge gap between the type locality (Southern New Caledonia) and French Polynesia, one can wonder to find this species on Tarava Seamounts stations, although some dead specimens were found in Tonga Archipelago (Vilvens, 2005). But the BENTHAUS adult shell shows all the characteristics of the New Caledonian species, especially the uniform white colour, the same ratio H/D (about 1.08), a spiral cord P1 commencing only at 2nd whorl, S2 appearing at 3rd whorl and S1 appearing at 4th whorl, a base with 14 spiral cords with the innermost stronger and granular. The only differences for the Polynesian samples are a spiral cord P4 emerging later (instead of present immediately but partly covered by next whorl), a spiral cord S3 absent (but this can happen, *fide* original description) and a smaller protoconch (only less than 300 µm for the Polynesian adult specimen).

Calliostoma (Fautor) lepton n. sp.
Colour Figs C1-C2, Figs 55-56

Type material. Holotype (12.6 x 10.8 mm) MNHN (24976).

Type locality. French Polynesia, Tuamotu Archipelago, TARASOC, stn DW3370, 15°39'S, 146°52'W, 315 340 m.

Material examined. Tuamotu Archipelago. TARASOC: stn DW3370, 15°39'S, 146°52'W, 315-340 m, 1 lv (holotype).

Distribution. French Polynesia, Tuamotu Archipelago, 315-340 m (dead).

Diagnosis. A rather small yellowish light brown *Calliostoma* species with a moderately elevated spire, coeloconoidal in shape in upper part and cyrtoconoidal in lower part, with a subangular periphery; aperture and columella highly nacreous; 6 main granular spiral cords on last whorls, axial threads visible between cords; base moderately convex base with about 12 granular cords; no umbilicus.

Description. *Shell* of rather small size for the genus (height 12.6 mm, width 10.8 mm), slightly higher than wide, rather thick, coeloconoidal in upper part, cyrtoconoidal in lower part, with a subangular periphery; spire moderately elevated, height 1.2x width, 3.1x aperture height; anomphalous.
Protoconch about 250-300 µm (apex eroded), with a thin varix.

Teleoconch up to 6.7 convex whorls, with 6 main, granular, similar in size spiral cords and an additional peripheral cord on last whorl; beads of all cords rounded conical, bluntly pointed. Suture not canaliculated, poorly visible.
First whorl convex, sculptured by thick axial folds and 3 primary spiral cords P1, P2 and P3 more or less similar in size, rather low, granular by intersection with folds; distance between folds 1.5x size of folds; distance between cords similar in size to cords. On second whorl, spiral cords stronger and wider, with well rounded beads; P3 slightly stronger than other cords, with rounded conical beads; axial folds more prosocline. On third whorl, beads of all cords bluntly pointed; P4 emerging from suture at end of whorl, beaded, weaker than other cords. On fourth whorl, P4 stronger, similar in size and shape to other cords; distance between P4 and P3 smaller than cords, distance between other cords similar in size to cords; S2 appearing at end whorl, thinner than other cords; axial folds weakening into axial threads. On fifth whorl, S1 appearing at mid whorl; S3 absent. On last whorls, all cords similar in size except P4 slightly stronger; all cords with conical, blunt pointed beads; axial threads weak but still visible; T1 appearing between P2 and S2; S4 visible on last whorl, peripheral, thinner than other cords; distance between all Pi and Si similar in size to cords, except S4 closer to P4; T2 appearing between S1 and P2.
Aperture subelliptic, slightly prosoclinely elongated; outer lip with nacreous thickened inside, with fine ridges at rim, without angle at meeting with thick inner.
Columella weakly arcuated, slightly oblique, thick and nacreous, flaring at lower part, without tooth.
Base moderately convex, with 12 granular spiral cords; subquadrate beads of cords made by thin axial threads across base; distance between cords smaller than cords; size of cords increasing in width from outer part of base to inner part.
No umbilicus (closed by columellar expansion).
Colour of protoconch and teleoconch yellowish light brown; base shiny white; aperture and columella nacreous.

Discussion. The new species is rather close to *Calliostoma (Fautor) necopinatum* Marshall, 1995 (Figs 57-58) from New Caledonia, but this similar in size species has a different, narrowly conical, weakly cyrtoconoidal shape, more convex last whorls, a spiral cord S3, a wider protoconch (400-420 µm) and a subquadrangular thin aperture without ridges inside.

Etymology. Hazelnut (Greek : λεπτον), used in apposition as a noun - with reference to light hazelnut colour of the shell, reminding of a cut hazelnut.

Genus ***Thysanodonta*** Marshall, 1988
Type species : *Thysanodonta aucklandica* Marshall, 1988 (by o.d.) – Recent, New Zealand.

Thysanodonta cf ***aucklandica*** Marshall, 1988
Figs 59-60

Thysanodonta aucklandica Marshall, 1988: 217-219, figs 3A-C. Type locality: off Auckland Islands, New Zealand, 549 m.

Material examined. Tuamotu Archipelago. TARASOC: stn DW3389, 14°55'S, 148°15'W, 889 m, 1 dd.

Comments. This single specimen (6.8 x 5.5 mm) has the spiral cords ontogeny of *T. aucklandica* (P1-P2-S2-P3-S4 with P4 peripheral on last whorl), but has only 7 spiral cords on the base (instead of 10 *fide* original description Marshall, 1988). This specimen, with first whorls rather eroded and an indistinct suture, could be subadult because its teleoconch has only 5.3 whorls. Additional material is clearly needed to decide if this is a different species or not.

Family **TURBINIDAE** Rafinesque, 1815
Subfamily **MARGARITINAE** Thiele, 1924
Genus ***Gaza*** Watson, 1879
Type species: *Gaza daedala* Watson, 1879 (by o. d.) - Recent, Fiji Islands.

Gaza polychoronos n. sp.
Colour Figs B1-B2, Figs 61-67, Table 5

Type material. Holotype (14.5 x 18.4 mm) MNHN (24977). Paratype (12.9 x 16.5 mm) MNHN (24978).

Type locality. French Polynesia, Société Islands, Bora Bora, TARASOC, stn DW3418, 16°33'S, 151°48'W, 580-618 m.

Material examined. French Polynesia, Société Islands. TARASOC: stn DW3418, 16°33'S, 151°48'W, 580-618 m, 1 lv (holotype). – Stn DW3497, 17°43'S, 149°14'W, 365-850 m, 1 lv (paratype).

Distribution. French Polynesia, Société Islands, living at 580-618 m.

Diagnosis. A rather small white *Gaza* species with a moderately elevated, more or less conical spire, a rounded periphery; first whorls smooth, last whorls with numerous spiral cords, granular on adapical half and almost smooth on abapical half; granular callus covering a fairly wide umbilicus.

Description. *Shell* of rather small size for the genus (height up to 14.5 mm, width up to 18.4 mm), wider than high, thin, conical, with a rounded periphery; spire moderately elevated, height 0.7x to 0.8x width, 1.8x to 2.2x aperture height; fairly broad umbilicus.
Protoconch of about 200-250 µm, of 1.25 whorl, low, smooth, glossy, without terminal varix.

Teleoconch up to 5.8 convex whorls, bearing numerous spiral, similar in size cords; adapical cords granular, abapical cords smooth; on last whorls, thin, prosocline axial threads between spiral cords. Suture visible, not canaliculated.

First whorl convex, almost smooth with growth lines poorly visible. On second whorl, low, poorly marked, axial folds appearing under suture. On third whorl, axial folds stronger, weakly prosocline, ending on adapical part with a rounded bead; 4 smooth, very thin, spiral cords appearing on abapical half. On fourth whorl, axial folds thinner, becoming thin threads, more numerous and more prosocline, covering all adapical half; subsutural beads resolving in a subsutural, roundly granular, spiral cord; at begin of whorl, 4 thin spiral cords appearing on adapical half, increasing in number by intercalation under suture, giving a reticulate pattern by intersection with axial threads; abapical cords nearly smooth to subgranular. On last whorls, number of spiral cords reaching 16 to 18; cords evenly spaced, distance between cords similar in size or slightly greater than cords, very different in shape on the two halves: cords of abapical half rather thin, almost smooth or slightly subgranular, elevated, with thin axial threads between them; cords of abapical half thicker, lower, granular,

Aperture well rounded, slightly deflected on adult shell, with small, inner denticles all around outer and inner lip; outer lip slightly flared at rim, inner lip meeting outer lip with a weak angle on subadult specimen.

Columella arched, without tooth, with a basal flaring on subadult sample.

Base convex, with up to 30 spiral cords; up to 50 axial threads around umbilicus; distance between spiral cords smaller than cords; cords of two outermost thirds smooth, thin; cords of innermost third wider, granular by intersection with axial threads.

Umbilicus fairly wide (diameter 9% to 10% of shell width), deep, funnel shaped, with steep sloping, slightly concave walls, covered by a moderately thin columellar callus (broken on paratype) covered by numerous, irregular in size and shape granules; thin, weak axial threads inside.

Colour of teleoconch nacreous white with pinkish sheen; protoconch pinkish brown (holotype).

	TW	H	W	HA	H/W	H/HA
holotype	5.8	14.5	18.4	6.7	0.79	2.16
paratype	5.6	12.9	19.5	7.1	0.66	1.82

Table 5. - *Gaza polychoronos* n. sp.: Shells measurements in mm for types.

Discussion. The new species is provisionally placed into the *Gaza* genus, regarding its spiral sculpture, its rounded, prosocline aperture and the umbilical callus, although it has an only weakly descending suture and a poorly reflected peristome (features used by Simone, 2006).

The new species is rather close to *Gaza daedala* Watson, 1879 (Figs 68-69) from Fiji, but this similar in size species has much thinner, more numerous spiral cords on the whorls (25 spiral lines in penultimate whorl), has a higher H/W ratio (1.24), a body whorl with a weak spiral carina between middle and lower thirds and a smooth, not granular callus.

Etymology. Bead-shaped object (Greek : χορονοζ) and numerous (Greek : πολυζ, λη, λυ), used as a noun in apposition - with reference to the granular umbilical callus.

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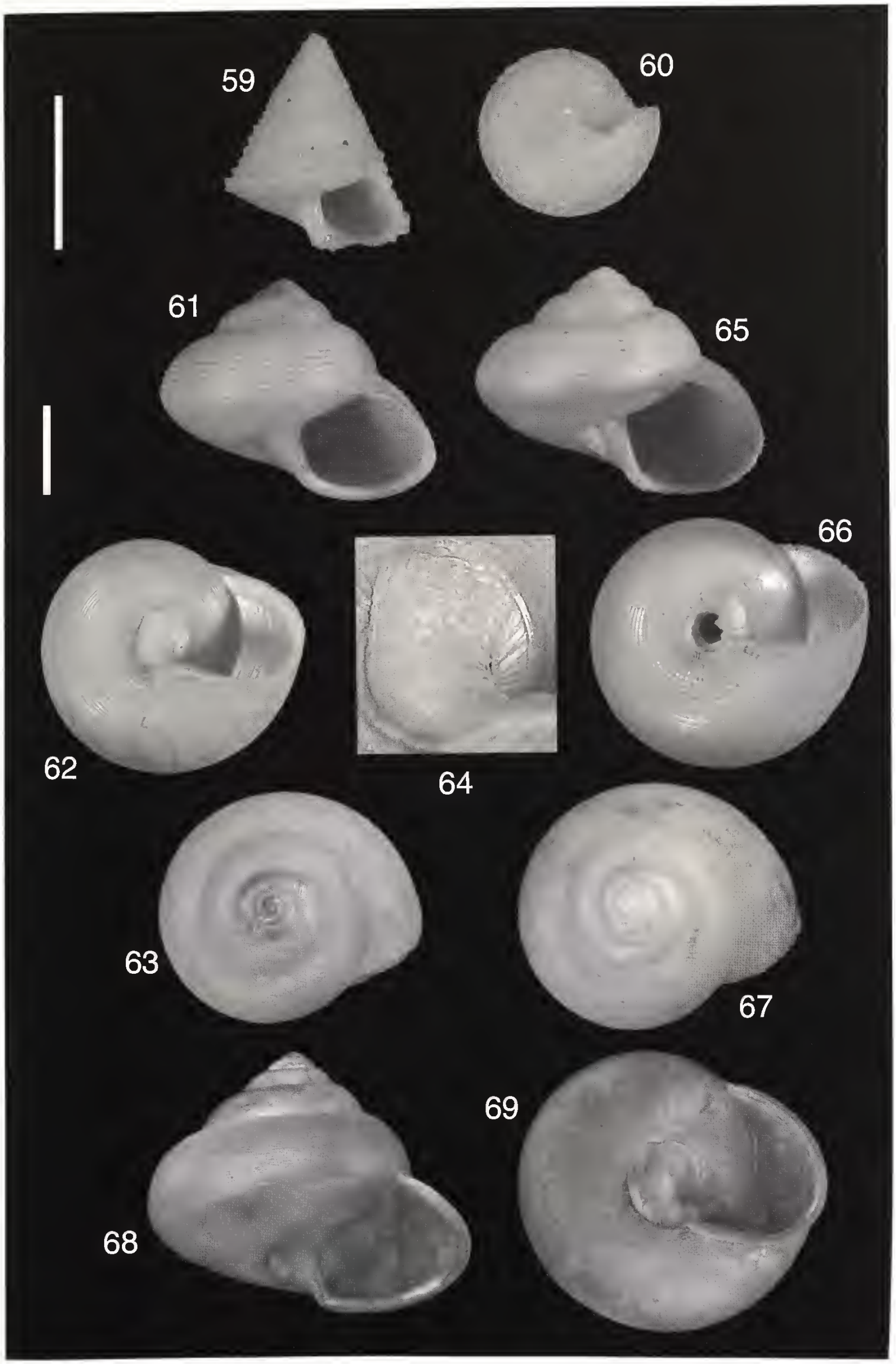
Figures 59-69. Scale bars = 5 mm.

59-60. *Thysanodonta* cf *aucklandica* Marshall, 1988, Tuamotu Archipelago, 889 m [TARASOC, stn DW3389], 6.8 x 5.5 mm.

61-67. *Gaza polychoronos* n. sp., Société Islands. **61-64.** Holotype MNHN (24977), 580-618 m [TARASOC, stn DW3418]. **61-63.** 14.5 x 18.4 mm; **64.** Detail of the granular callus. **65-67.** Paratype MNHN (24978), 520-572 m [TARASOC, stn DW3497], 12.9 x 16.5 mm.

68-69. *Gaza daedala* Watson, 1879, holotype NHMUK (1887-2-9-346), Fiji, Kandavu, 1128 m, 20.6 x 17.0 mm – Photographs courtesy of Phil Crabb, NHMUK Photographic Unit.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WoRMS (World Register of Marine Species)
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Description of a new species in the *Siratus pliciferoides* group (Gastropoda: Muricidae) from the Philippines

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KEYWORDS. Philippines, Gastropoda, Muricidae, *Siratus* n. sp.

ABSTRACT. A new species of *Siratus* is described from Balut Island, Philippines. It is compared with *Siratus pliciferoides* (Kuroda, 1942). The synonymy of *Siratus pliciferoides* is reviewed and commented.

RESUME. Une nouvelle espèce de *Siratus* est décrite de l'île de Balut aux Philippines. Elle est comparée à *Siratus pliciferoides* (Kuroda, 1942). La synonymie de *Siratus pliciferoides* est passée en revue et commentée.

INTRODUCTION

The *Siratus pliciferoides* group contains four names usually considered to be monospecific: *Chicoreus pliciferoides* (Figs 4-7, 15) was described by Kuroda (1942: 81) as a substitute name for *Murex pliciferus* Sowerby, 1841 which was preceded by, and thus a homonym of, *M. pliciferus* Bivona-Bernardi, 1832. The species occurs widely in an area consisting of the Philippines, the China Seas, Taiwan and southern Japan.

Murex (Siratus) propinquus was described by Kuroda & Azuma in Azuma (1961: 300) for a quite similar shell from Japan but with a comparatively lower spire, a shorter siphonal canal and a broader last teleoconch whorl. This form is currently known from Western Australia as well as from the Philippines, Taiwan and Japan (Figs 8-10).

A third name, *Siratus hirasei* was given by Shikama (1973: 5) who described another form from Japan, with broad varices, short spines and broad, straight, short siphonal canal as illustrated here (Figs 11-12).

Finally, *S. vicdani* was described by Kosuge (1980: 55) who separated it from both *S. alabaster* (Reeve, 1845) and *S. pliciferoides*. It differs from the latter by having angulate shouldered spire whorls and more strongly webbed varices (Figs 13-14).

Siratus pliciferoides being the oldest available name, all the other names were considered objective junior synonyms by Vokes (1971: 86), Fair (1976: 69) and Radwin & D'Attilio (1976: 107), for *Siratus propinquus* only, the other shells having been described after Vokes (1971). Fair (1976) and Radwin & D'Attilio (1976) probably were not aware of the description of *Siratus hirasei* in a little-known Japanese publication.

Houart (1992: 110) and Merle et al (2011: 100) also considered all these names as being conspecific.

Since 1992, I had the opportunity to examine numerous specimens of all these forms from the geographical distribution area and I am less certain about some of these names being synonym of *S. pliciferoides*. Maybe eventual DNA researches will confirm or invalidate the validity of these names.

Another new species, probably part of this group, is here described for the first time from the Philippines.

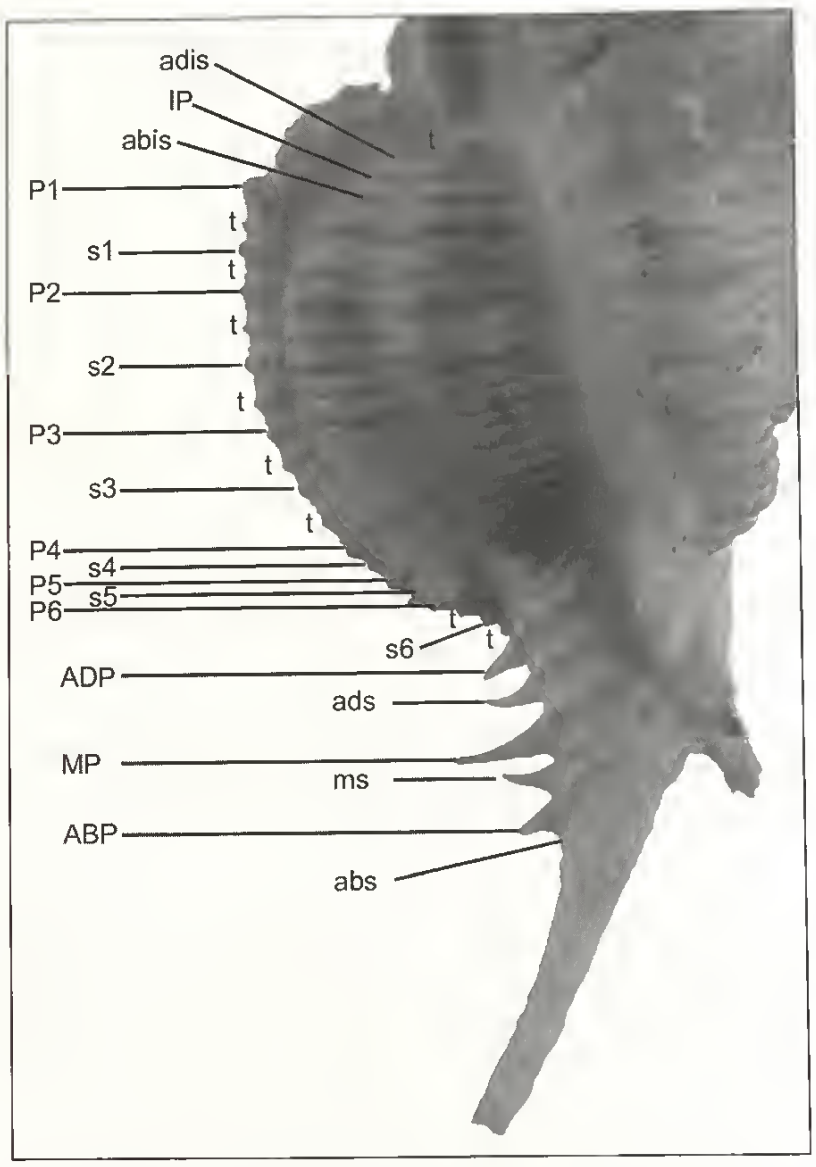
Abbreviations

Repository

EGS coll. : Collection of Evelyn Guillot de Suduiraut
IRSNB: Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
RH coll. : Collection of the author.

Terminology used to describe the spiral cords (after Merle, 1999 and 2001) (Text Fig. 1)

P: primary cord; **s:** secondary cord; **t:** tertiary cord; **ad:** adapical (or adapertural); **ab:** abapical (or abapertural); **IP:** infrasutural primary cord (primary cord on subsutural ramp); **adis:** adapical infrasutural secondary cord (on subsutural ramp); **abis:** abapical infrasutural secondary cord (on subsutural ramp); **P1:** shoulder cord; **P2-P6:** primary cords of the convex part of the teleoconch whorl; **s1-s6:** secondary cords of the convex part of the teleoconch whorl (example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.); **ADP:** adapertural primary cord on the siphonal canal; **MP:** median primary cord on the siphonal canal; **ABP:** abapertural primary cord on the siphonal canal; **ads:** adapertural secondary cord on the siphonal canal; **ms:** median secondary cord on the siphonal canal; **abs:** abapertural secondary cord on the siphonal canal.



Text Fig. 1. Spiral cords terminology (paratype MNHN)

SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815
Subfamily **MURICINAE** Rafinesque, 1815
Genus ***Siratus*** Jousseaume, 1880
Type species, by original designation: *Purpura Sirat* "Adanson" Jousseaume, 1880 (= *Murex senegalensis* Gmelin, 1791), Recent, Brazil.

Siratus evelynae n. sp.
Text Figs 1-2, Figs 1-3

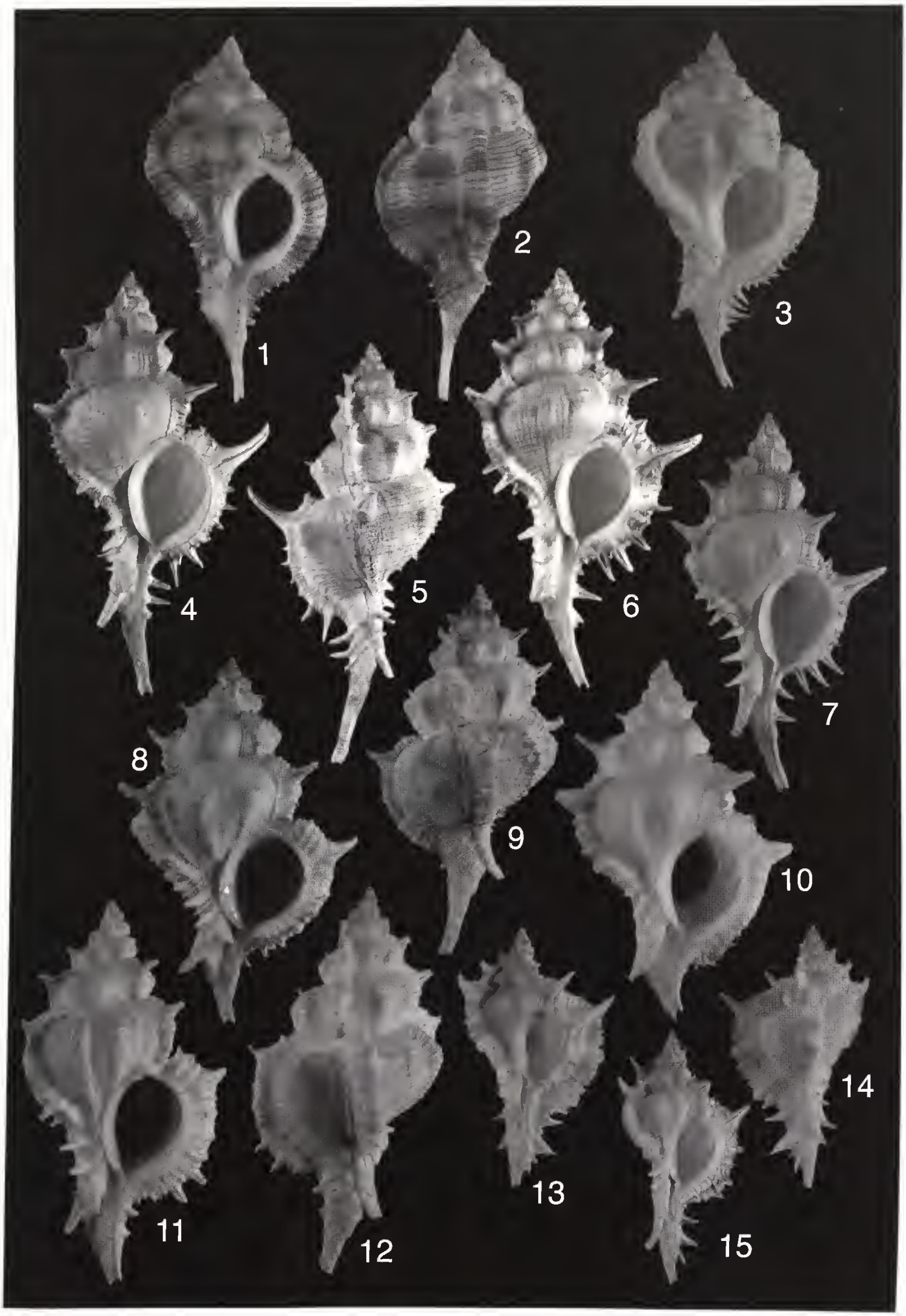
Type material. Philippines, Digos, Davao del sur, coral rubble, 150-200 m, by tangle nets, holotype IRSNB IG.32073/MT2574.
Paratypes: Philippines, Balut Island, south of Mindanao, in 400 m, by tangle net, 1 MNHN IM-2010-19527; Digos, Davao, in 400 m, by tangle nets, 2 RH coll.; Davao, coral rubble, sandy mud, 200-400 m, by tangle net, 1 RH coll, 1 EGS coll.

Distribution. Currently only known from the type material: Philippines, south of Mindanao, live in 150-400 m, by tangle nets.

Description. Shell medium sized for the genus, up to 112 mm in height (paratype EGS). Height/width ratio 2.0-2.2. Slender, biconical, broadly ovate, heavy, very weakly spinose, tuberculate. Subsutural ramp broad, strongly sloping, convex. Creamy white or light tan with tan, brown or dark brown spiral cords. Aperture white.
Spire high, acute, with a teleoconch of 8 broadly convex, weakly shouldered, nodose whorls. Suture weakly adpressed. Protoconch unknown.
Axial sculpture of teleoconch whorls consisting of high, broad, rounded ribs and high, narrow, rounded varices. Two first teleoconch whorls croded. Three varices and two intervarical broad ribs from third to last whorl. Last whorl occasionally with two broad and one narrow ribs on last portion of whorl, between second and apertural varix. Spiral sculpture of low, narrow, primary, secondary, tertiary cords and narrow threads. Spiral sculpture of shoulder ramp of last teleoconch whorl consisting of adis, IP and abis with a tertiary cord between each. Convex part of last teleoconch whorl of P1 (shoulder cord), t, s1, t, P2, t, s2, t, P3, t, s3, t, P4, s4, P5, s5, P6, t, s6, t, ABP, abs, MP, ms, ABP, abs. Few threads and secondary cords occasionally of same strength and height; occasionally with a few additional narrow threads.
Aperture moderately large, roundly ovate. Columellar lip narrow, smooth, with strong, low parietal tooth at adapical extremity. Lip adherent. Anal notch deep, narrow. Outer lip erect, crenulated with numerous, elongate, narrow denticles within, many of them split. Siphonal canal long, 39-43% of total shell length., broad adapically, abruptly tapered and very narrow abapically, weakly recurved dorsally.
Operculum dark brown, ovate, inverted tear-shaped, with apical nucleus and 9 or 10 concentric ridges at outer surface. Attached surface with 10 growth lines and broad, callused rim.
Radula unknown.

Figures 1-15

1-3. *Siratus evelynae* n. sp.
1-2. Philippine, Digos, Davao del sur, coral rubble, 150-200 m, holotype IRSNB IG.32073/MT2574 , 83.3 mm; **3.** Balut Island, south of Mindanao, in 400 m, paratype MNHN IM-2010-19527, 81.7 mm.
4-7. *Siratus pliciferoides* (Kuroda, 1942). **4-5.** Northeast of Taiwan, RH, 134 mm; **6.** Philippines, Bohol, RH, 128.4 mm; **7.** Japan, Tosa, RH, 113.5 mm; **8-10.** *Siratus pliciferoides* "form" *propinquus* Kuroda & Azuma, 1961; **8-9.** Northeast of Taiwan, RH, 106.4 mm; **10.** West Australia, Port Hedland, RH, 93.2 mm; **11-12.** *Siratus pliciferoides* "form" *hirasei* Shikama, 1973, Japan, Minabe, RH, 96.1 mm; **13-14.** *Siratus pliciferoides* "form" *vicdani* Kosuge, 1980, Philippines, Mactan, RH, 38.4 mm; **15.** *Siratus pliciferoides* (Kuroda, 1942), Philippines, juvenile, RH, 38.2 mm.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Remarks. *Siratus evelynae* is probably related to the *Siratus pliciferoides* group, however it differs consistently from *S. pliciferoides* and related forms in being more strongly biconical, in having a last teleoconch whorl with a more sloping shoulder ramp, giving the shell a more rounded shape *vs* shouldered in *S. pliciferoides* and related forms, and in starting a broad siphonal canal but promptly tapering to become very narrow at its abapical extremity.
Siratus evelynae also differs in having a spineless shell except for a series of short, acute, broadly open, webbed spines abapically. The new species also has a lower spire compared to the shell height, being of 27-28% of total shell height in *S. evelynae* n. sp. *vs* 37-39% in *S. pliciferoides* and 41-46% in *Siratus propinquus* or the "*propinquus*" form, whatever it may be. The two other names are strongly related to *S. pliciferoides* and do not need to be compared here, although illustrated (Figs 11-14).

Etymology. I am very happy to dedicate this new species to Evelyn Guillot de Suduiraut, wife of the late well-known Emmanuel Guillot de Suduiraut.

Text Fig. 2. Distribution map

ACKNOWLEDGEMENTS

I am greatly indebted to Evelyn Guillot de Suduiraut and to her daughter Jackylen to having brought my attention to this interesting species and for the gift of the holotype. Many thanks also to John Wolff, Lancaster, Pennsylvania, USA, for checking the English text and to Claude Vilvens, Oupeye, Belgium for critical comments.

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A new species of the genus *Leucorhynchia* (Gastropoda, Turbinidae) from West Africa

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KEYWORDS. Turbinidae, *Leucorhynchia*, West Africa, new species.

ABSTRACT. A new species of *Leucorhynchia* is described from Principe Island, West Africa. It is compared with *L. lirata* (E.A. Smith, 1871).

INTRODUCTION

The genus *Leucorhynchia* Crosse, 1867 was considered of Indo-Pacific distribution until it was reported from the West African coast by Adam & Knudsen (1969), who described a new species: *Leucorhynchia bicarinata* and figured two more species previously included in the genus *Ethalia*: *Leucorhynchia plicata* (Smith, 1871) and *L. lirata* (E.A. Smith, 1871).

Rubio & Rolán (1991) illustrated specimens of *Leucorhynchia bicarinata* and *L. lirata* collected in São Tomé and Principe, giving from the latter one drawing of the soft parts and SEM photographs of the protoconch and radula. At the same time they included in the same genus *L. punctata* (Jousseaume, 1872), previously placed in the genus *Teinostoma* A. Adams, 1853.

So far, there are four recognized species within the genus *Leucorhynchia*: *L. caledonica* Crosse, 1867 (type species of the genus), of Indo-Pacific distribution, the other three having a West African distribution: *L. punctata* Jousseaume, 1872, *L. lirata* (E.A. Smith, 1871) and *L. bicarinata* Adam & Knudsen, 1969

In the sediments recently collected at the island of Príncipe by the Italian malacologist Sandro Gori, during a visit to the islands of São Tomé and Principe, some shells appeared to belong to a new species, which is described in the present work.

SYSTEMATICS

Family **TURBINIDAE** Rafinesque, 1815
Subfamily **SKENEINAE** Clark, 1851
Genus ***Leucorhynchia*** Crosse, 1867
Type species: *Leucorhynchia caledonica* Crosse, 1867. Recent. New Caledonia.

Leucorhynchia gorii spec. nov.
Figs 6-7, 9, 11

Type material. Holotype (Fig. 7) deposited in the Muséum National d'Histoire Naturelle, Paris (MNHN 24633). Paratypes: Museo de Ciencias Naturales of Madrid (MNCN 15.05/60001,1 shell) (Fig 6); Museo de Historia Natural de Santiago de Compostela (MHNS 100556, 1 shell); collection of Sandro Gori (1 shell).

Type locality. Tinhosa Pequena, 25 m, Island of Principe, Republic of São Tomé and Principe.

Distribution. Only known from the type locality.

Description. Shell minute, lenticular, solid, and cream in colour. Protoconch with only one smooth whorl and a diameter of 227-230 µm. Teleoconch with a little over two whorls, almost lacking sculpture at the beginning, but on which some sulci shortly appear; they are undulating at first and after the first whorl are of circular shape; they become more irregular and on the last half-whorl they turn into smooth cords, a little irregular, separated by spaces almost of a similar width and where it is possible to see under magnification, tubercles and lines in an axial direction are observed. In the ventral side there is a well opened umbilicus, within which there are four prominent spiral sulci. In the border of the umbilical infundibulum short axial ribs are formed. The spire ends in a circular and very regular aperture with a narrow and free peristome, which extends until getting in contact with the previous whorl.

Dimensions. Holotype 1.5 mm in diameter; paratypes are of a similar size.

Discussion. *Leucorhynchia gorii* spec. nov. shows an apparent similarity with *L. lirata*, because of its rounded form, its small protoconch, the beginning of the spiral sculpture with cords with depressions, which later disappear. But *L. lirata* has a larger shell (up to 3.5 mm, as opposed to 1.6 mm the new species may reach). The number of whorls in the teleoconch of an adult *L. lirata* is about 3 ¼, while *L. gorii* has no more than 2 ¼ whorls. The spiral whorls which form the sculpture of the teleoconch, after the first whorl, have smaller interspaces in *L. lirata* and wider in *L. gorii*. The most important difference between these two species is on the base where *L. lirata* has a very close umbilicus while that of *L. gorii* is wider showing the spiral cords on its inner part. The juveniles of *L. lirata* have a wider umbilicus but are similar in size to *L. gorii*; the aperture of *L. lirata* has quicker development and the umbilicus is bordered by very different elevated cords.

Etymology. The new species is named after Sandro Gori who collected the sediments where the shells were found.

ACKNOWLEDGEMENTS

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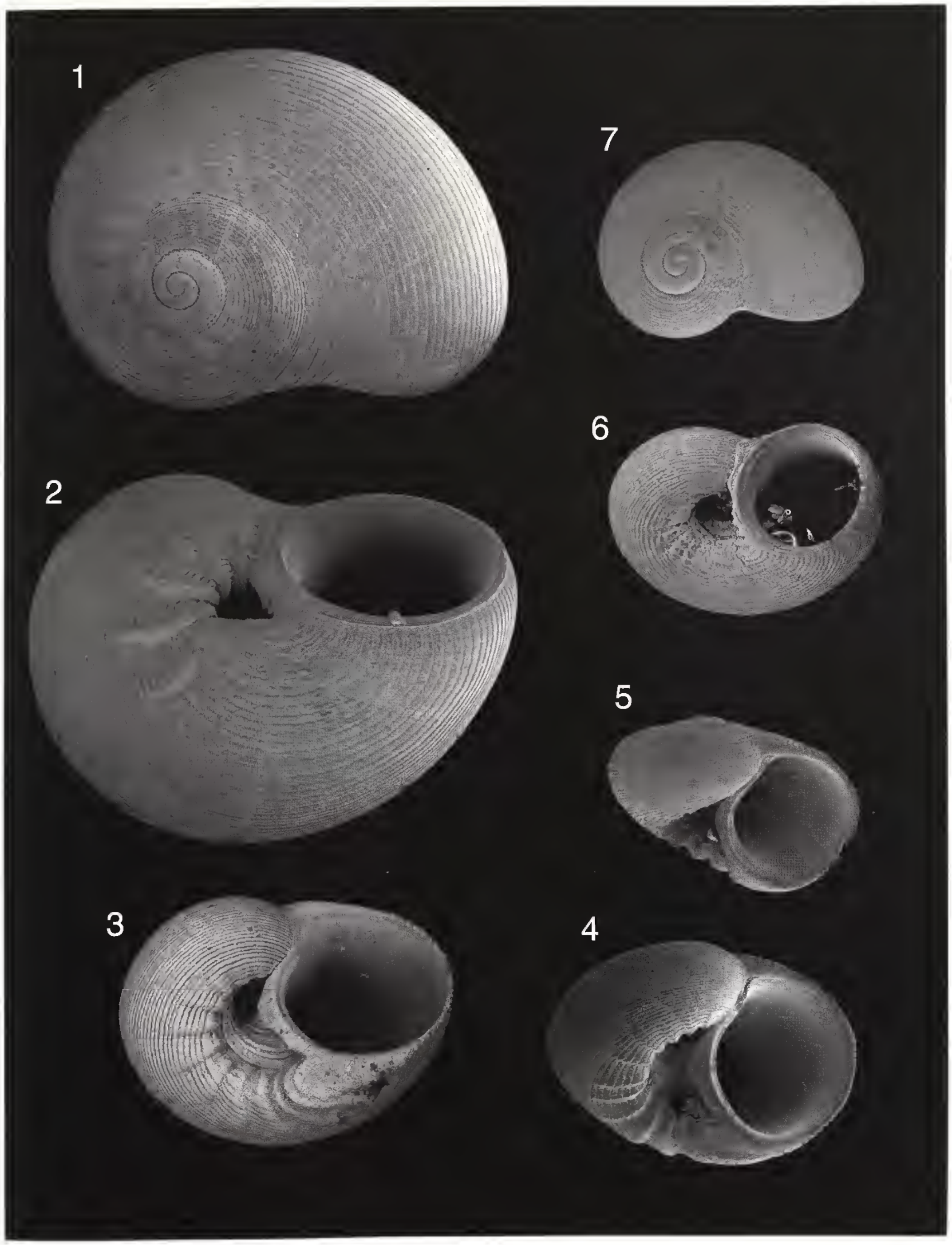
Figures 1-7

1-5. *Leucorhynchia lirata* Adam & Knudsen, 1969.
1-2. Adult shell, 2.9 x 3.0 mm, Tinhosa Pequena, Principe I.; **3-5.** Juveniles, 1.9, 1.8 and 1.54 mm, Tinhosa Pequena.
6-7. *Leucorhynchia gorii* spec. nov.
6. Paratype, 1.6 mm (MNCN 15.05/60001); **7.** Holotype, 1.5 mm (MNHN 24633).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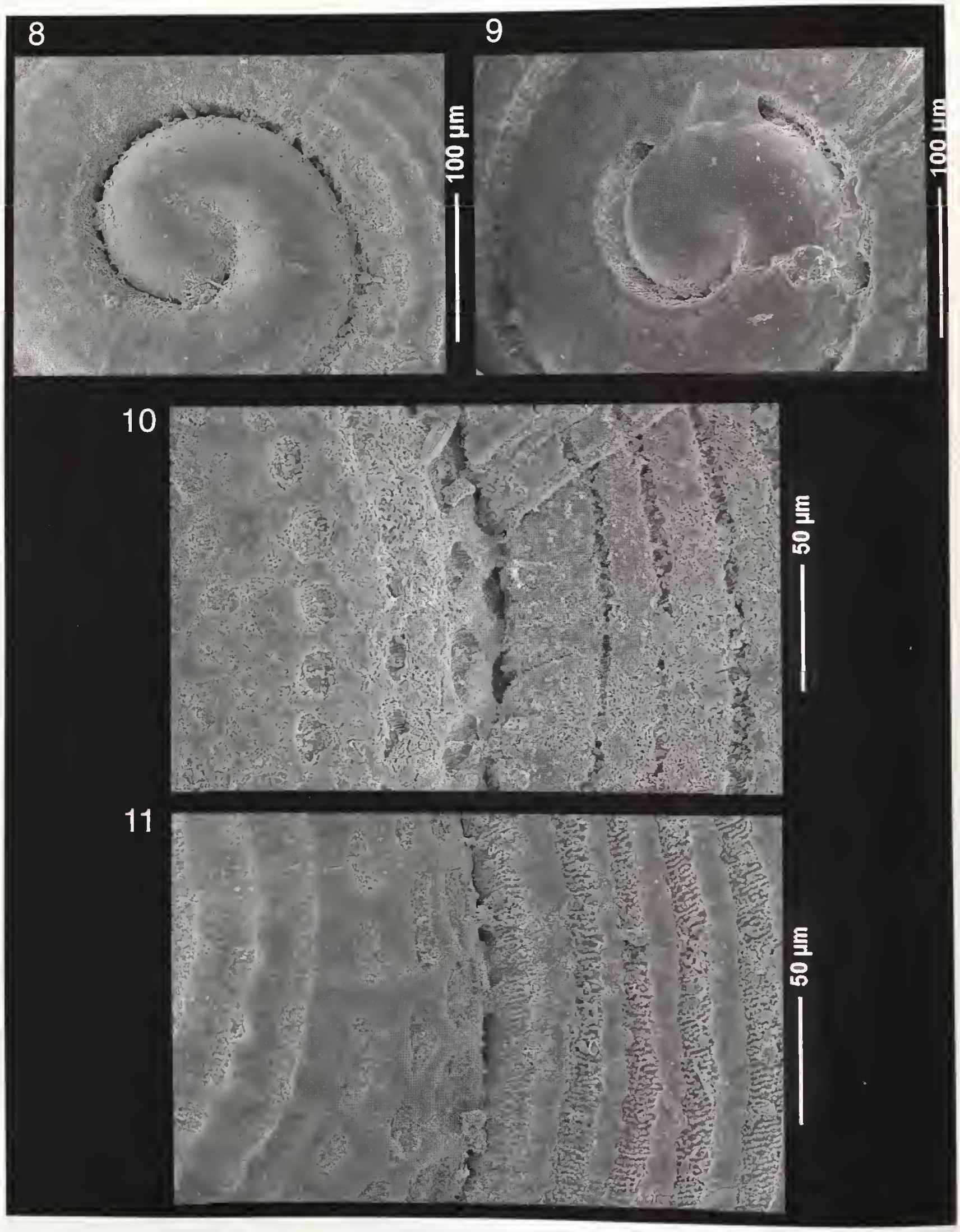

Figures 8-11

8-19. Protoconchs of *Leucorhynchia* species
8. *Leucorhynchia lirata* Adam & Knudsen, 1969; **9.** *Leucorhynchia gorii* spec. nov.
10-11. Microsculpture of *Leucorhynchia* species
10. *Leucorhynchia lirata* Adam & Knudsen, 1969; **11.** *Leucorhynchia gorii* spec. nov.

A new Javan species of *Agaronia* Gray, 1839 (Neogastropoda, Olividae)

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KEYWORDS. Olividae, Indian Ocean, Java, Indonesia, *Agaronia johnabbasi* sp. nov.

ABSTRACT. A new species of olivid neogastropod from West Java, *Agaronia johnabbasi* sp. nov., is described according to conchological characters. It is distinguished from congeners by means of its distinctive morphology and colouration.

INTRODUCTION

The highly evolved gastropods in the family Olividae are found circumglobally in predominantly tropical or subtropical waters. All inhabit soft substrates including sand and silt, though the depths at which different species may be found vary from the littoral to the sublittoral. The genus *Agaronia* Gray, 1839 is sometimes regarded as forming part of the subfamily Agaroniinae Olsson, 1956 (Olsson, 1956; Ponder & Warén, 1988; Vaught, 1989; Sterba, 2004); though in Bouchet & Rocroi (2005), this taxon is synonymized with Olivinae Latreille, 1825. The majority of species are concentrated along the west African and east American coastlines, with some Indian Ocean representatives that include the species described herein (see Table 1 for a complete list of recent species).

Abbreviations

Descriptive: **D** – diameter; **H** – height.

Repositories: **DC**: collection of author, Santa Venera, Malta; **GP**: collection of Guido T. Poppe, Cebu, Philippines; **JA**: collection of John Abbas, Jakarta, Indonesia; **MNHN**: Muséum national d'Histoire naturelle, Paris, France; **NMNH**: National Museum of Natural History, Mdina, Malta.

MATERIALS & METHODS

Seven shells were collected by fishermen with bottom trawling nets from the eastern bay in Pangandaran, West Java, in late 2009, at a depth of about 60m. Their shell morphology was compared and contrasted with that of the five known sympatric congeners. Maximum diameter and height of the shells, the former incorporating the lip, were measured twice using a dial caliper with a resolution of 50µm, the average of the two measurements was then calculated and noted.

SYSTEMATICS

Family **OLIVIDAE** Latreille, 1825
Subfamily **OLIVINAE** Latreille, 1825
Genus ***Agaronia*** Gray, 1839
Type species by monotypy *Voluta hiatula* Gmelin, 1791, West Africa

Agaronia johnabbasi sp. nov.
Figs.1-6

Type material. Collected by fishermen, c. -60m on silty substrate, east Pangandaran Bay, Java, Indonesia, October 2009. Holotype **MNHN** 23267; paratypes: **DC** R.GA1000-1; **GP** unreg.; **JA** unreg.; **NMNH** unreg.

Type locality. East Pangandaran Bay, Java, Indonesia.

Description. Dextral solid shell, of maximum height of about 40mm and a height/diameter ratio of about 2.8. Spire tall and conical, with a slightly concave profile and featuring a spiral callus occupying about half the height of each whorl. Widest band of the body whorl a uniform dark-orange brown, sometimes with a purplish tinge intensifying towards the suture. This colouration is continuous along the spire, contrasting with the orange-brown spiral callus. Thin wash of white callus present on the columellar side of the aperture close to the filament channel. Just above the postfasciole, a thin pale band is discernible. The postfasciole and the fasciole are of the same colour and are considerably paler than the main part of the body whorl, with the former featuring a few very fine spiral threads and numerous darker growth striae which do not extend upon the fasciole. The belt and the base of the columellar callosity are beige. Outer lip thin, with its outline recurved, and, at the proximity of the siphonal canal, almost parallel with the columellar side of the aperture.

Dimensions. See Table 2 for details.

Remarks. In colouration, the new species is remarkable in its distinct lack of pattern (except for the growth lines typical of all *Agaronia*) and, unusually for the genus, the colouration of the postfasciole and fasciole, which are lighter in colour than the main part of the body whorl. The type locality of the new species, Pangandaran Bay yields examples

of all other four Indian Ocean representatives of the genus (J. Abbas, pers. comm. XII.2009) (refer to Table 1). Of these, *Agaronia nebulosa* (Lamarck, 1811) may easily be distinguished by a reticulated pattern over a (generally) very pale background combined with a thick parietal callosity, while *Agaronia gibbosa* (Born, 1778) features reticulation, a significantly lower H/D ratio, a strongly marked postfasciole and a thick parietal callosity. The lighter, occasionally non-reticulated form *flavescens* Melvill, 1904 has a colour which is relatively close to that of *A. johnabbasi*, but the dimensions and the geographical provenance (South India) set it apart at first glance. *Agaronia lutaria* (Röding, 1798) is larger and more slender, with a narrower aperture and strong reticulation. The differences from *A. johnabbasi* are herein illustrated by a juvenile specimen of the same size as two of the paratypes (Figs 7-8). A closer relative of *A. johnabbasi* is *Agaronia johnkochi* Voskuil, 1990 (Figs 9-10). This is suggested by the absence of reticulation, a similarly curved outline of the outer lip, a similarly proportioned spire callus which does not bulge out disproportionately towards the aperture, and the strong demarcation of colour, in perpendicular direction to the filament channel, between the pigmented spiral and the whitish parietal calluses. However, the spire of *A. johnabbasi* is higher and more acutely angled than that of *A. johnkochi*, while the spiral callus is lighter in colour, contrasting less with the rest of the whorl. The widest part of the shell of *A. johnabbasi* is closer to the apical part of the shell, the parietal callus is thinner, and the oblique striae on the pillar structure are thinner and closer to each other, with no chromatic aberrations between them; all these features are consistent and may be used for morphological differentiation between the two species.

The gracile shell of *A. johnabbasi* is also similar to that of the West African *Agaronia hiatula* (Gmelin, 1791), but the outer lip is recurved and therefore the aperture is narrower.

Etymology. The species is named after John Abbas (Jakarta, Indonesia) who initially recognized the species as a new one, kindly bringing it to the author's attention.

ACKNOWLEDGEMENTS

The author is indebted to John Abbas for the specimens sent for examination, including comparative material, Eddy Wilmet (Mechelen, Belgium) for comparative material, Jon Camilleri (Birkirkara, Malta) for the photography of specimens, Roland Houart (Landen, Belgium) for editorial comments and recommendations and John J. Borg (NMNH), Philippe Bouchet & Virginie Héros (MNHN), Guido Poppe & Sheila Tagaro (conchology.be) for technical assistance.

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Figures 1-10

1-6. *Agaronia johnabbasi* sp. nov. East Pangandaran Bay, Java, Indonesia.
1-2. Holotype, MNHN 23267, 38mm; **3-4.** Paratype 1, DPC R.GA1000, 41mm; **5-6.** Paratype 4, NMNH unreg., 31mm.
7-8. *Agaronia lutaria* (Röding, 1798), East Pangandaran Bay, Java, Indonesia, 31mm (juvenile).
9-10. *Agaronia johnkochi* Voskuil, 1990. East Pangandaran Bay, Java, Indonesia, 47mm.

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Name and authority	Distribution	Oceanic division
Agaronia acuminata (Lamarck, 1811)	West Africa	East Atlantic
A. adamii Terzer, 1992	Philippines	West Pacific
A. annotata Marrat, 1871	West Africa	East Atlantic
A. cauta (Marrat, 1871)	West Africa	East Atlantic
***A. gibbosa* (Born, 1778)**	India to Malaya	East Indian Ocean
A. griseoalba (von Martens, 1897)	Central America (west)	East Pacific
A. hiatula (Gmelin, 1791)	West Africa	East Atlantic
A. hilli Petuch, 1987	Central America (east)	West Atlantic
A. jesuitarum López, Montoya-Maquín & López, 1988	Central America (west)	East Pacific
***A. johnabbasi* sp. nov.**	Indonesia	East Indian Ocean
***A. johnkochi* Voskuil, 1990**	Indonesia	East Indian Ocean
A. leonardhilli Petuch, 1987	Central America (east)	West Atlantic
***A. lutaria* (Röding, 1798)**	Indonesia	East Indian Ocean
***A. nebulosa* (Lamarck, 1811)**	Indonesia	East Indian Ocean
A. nica López, Montoya-Maquín & López, 1988	Central America (west)	East Pacific
A. propatula (Conrad, 1849)	Central America (west)	East Pacific
A. razetoi Terzer, 1992	West Africa	East Atlantic
A. steeriae (Reeve, 1850)	South America (east)	West Atlantic
A. testacea (Lamarck, 1811)	Central America (west)	East Pacific
A. travassosi Morretes, 1938	South America (east)	West Atlantic

Table 1. Recent species of *Agaronia* Gray, 1839 based on Marrat (1871), Petuch (1987), Sterba (2004), Teso & Pastorino (2011) and the present research. Bold type indicates species in close geographical proximity to the new species.

	Holotype MNHN 23267	Paratype 1 DC R.GA1000	Paratype 2 JA unreg.	Paratype 3 JA unreg.	Paratype 4 NMNH unreg.	Paratype 5 GP unreg.	Paratype 6 DPC R.GA1001	mean
H	38	41	40	33	31	31	28	35
D	14	15	14	12	11	11	10	12
H/D	2.7	2.7	2.9	2.8	2.8	2.8	2.8	2.8

Table 2. Dimensions of the type series of *Agaronia johnabbasi* sp. nov. (7 specimens) and their mean value. Measurements are in millimetres.

Description of *Muricopsis (Muricopsis) gorii* (Gastropoda: Muricidae: Muricopsinae) from southern São Tomé

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KEYWORDS. São Tomé, Muricidae, Muricopsinae, *Muricopsis* n. sp.

ABSTRACT. A new species of *Muricopsis* is described from Sete Pedras Island, São Tomé. It is compared with *Muricopsis matildeae* Rolán & Fernandes, 1991.

RESUME. Une nouvelle espèce de *Muricopsis* est décrite de l'île de Sete Pedras à São Tomé. Elle est comparée avec *Muricopsis matildeae* Rolán & Fernandes, 1991.

INTRODUCTION

A few muricopsine species were described recently from São Tomé and Príncipe and from Annobon Island by Rolán & Fernandes (1991), Houart & Rolán (2001), Houart (2005), Rolán & Gori (2007) and Houart & Gori (2008).

Four Recent species and one subspecies of *Muricopsis* s.s. were described from São Tomé: *M. (M.) matildeae* Rolán & Fernandes, 1991, *M. (M.) rutilus mariangelae* Rolán & Fernandes, 1991, *M. (M.) delemarrei* Houart, 2005, *M. (M.) hernandezi* Rolán & Gori, 2007, and *Muricopsis (M.) testorii* Houart & Gori, 2008. Two other species are known from two closely situated islands: *Muricopsis (M.) principensis* Rolán & Fernandes, 1991- which occurs only in Príncipe and *M. (M.) annobonensis* Houart & Rolán, 2001 which is endemic to Annobon Island.

The new species described herein was recently discovered east of Sete Pedras Island (Fig. 1).

Abbreviations

IRSNB: Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
PR: Collection Peter Ryall.
RH: Collection Roland Houart.
SG: Collection Sandro Gori.

Terminology used to describe the spiral cords and the internal denticles of the outer lip (based on Merle 1999 and 2001) (Fig. 2).

P: primary spiral cord; **SP:** subsutural cord; **P:** shoulder cord; **P2-P6** : primary cords of the convex part of the teleoconch whorl; **ADP:** adapical primary cord on the siphonal canal; **MP:** median primary cord on the siphonal canal; **ID:** infrasutural denticle of the aperture; **D1 to D5:** abapical denticles of the aperture

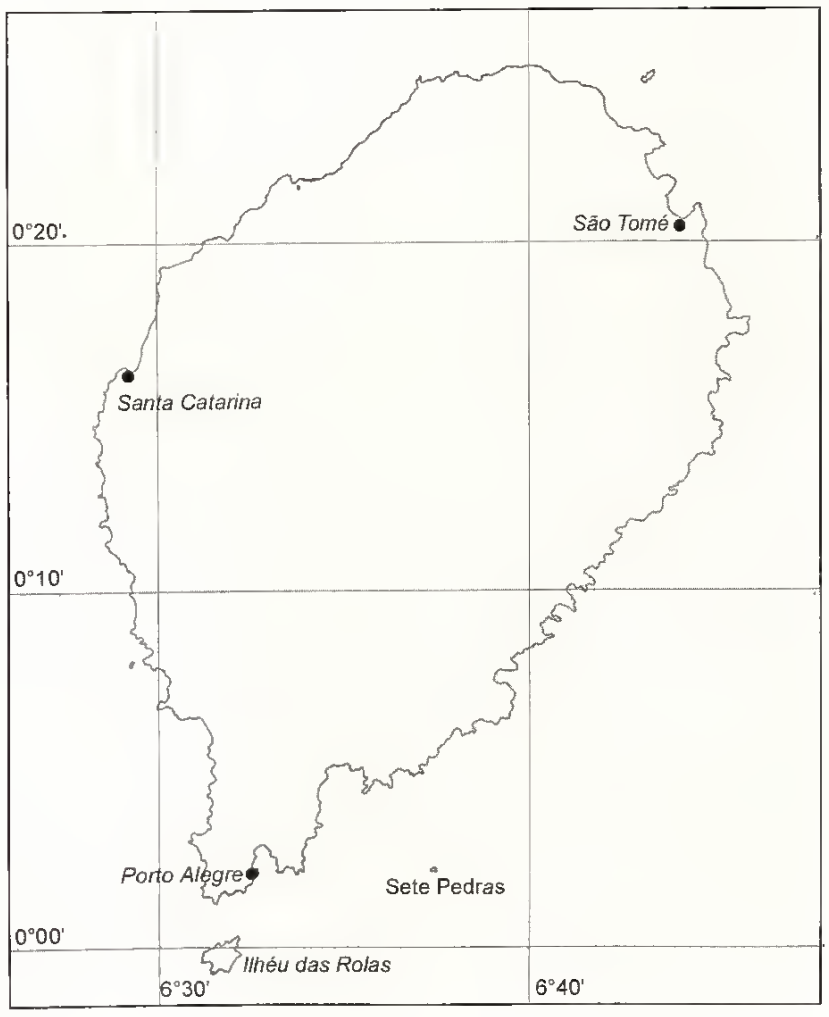

Fig. 1. Map of São Tomé and location of the type locality of *Muricopsis (M.) gorii* n.sp.

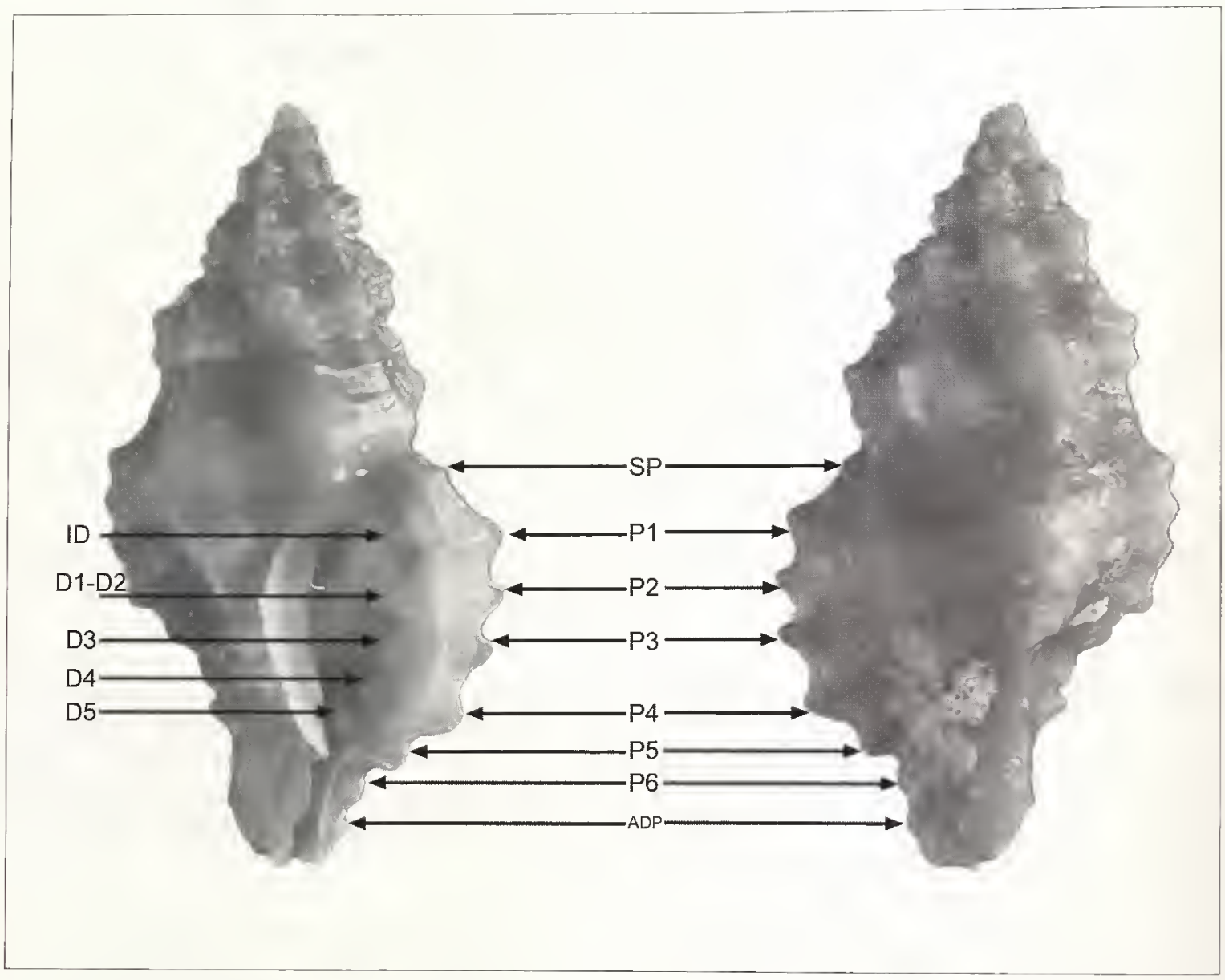

Fig. 2. *Muricopsis (Muricopsis) gorii* n. sp. Spiral sculpture and apertural denticle morphology (paratype SG, 9.6 mm).

SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815
Subfamily **MURICOPSINAE** Radwin & D'Attilio, 1971
Genus ***Muricopsis*** Bucquoy & Dautzenberg, 1882
Subgenus ***Muricopsis*** Bucquoy & Dautzenberg, 1882
Type species by original designation: *Murex blainvillei* Payraudeau, 1826 (= *Murex cristatus* Brocchi, 1814). Recent; Mediterranean.

Muricopsis (Muricopsis) gorii n. sp.
Figs 1, 2, 3-8

Type material. Holotype MNHN 24275, 8.6 mm, 1 paratype PR, 9.6 mm, 1 paratype RH, 9.6 mm, 2 paratypes SG, 8.5 mm and 9.9 mm, São Tomé, east of Sete Pedras, 30 m, collected on small rounded stones.

Distribution. Currently only known from Sete Pedras, São Tomé, in 30 m.

Description. Shell small for the genus, up to 9.9 mm in height at maturity. Height/width ratio 1.9 - 2.1. Slender, biconical, weakly spinose, nodose, lightly built. Subsutural ramp broad, weakly concave, weakly sloping on spire whorls, more strongly sloping on last teleoconch whorl. Bright orange, weakly darker coloured on subsutural ramp, outer edge of columellar lip and apertural denticles lighter coloured or white.

Figures 3-15

3-8. *Muricopsis (Muricopsis) gorii* Houart, n. sp., East of Sete Pedras, São Tomé, on small rounded stones, 30 m
3-4. Holotype MNHN 24275, 8.6 mm; **5-6.** Paratype SG, 9.9 mm; **7-8.** Paratype RH, 9.5 mm.
9-14. *Muricopsis (Muricopsis) matildeae* Rolán & Fernandes, 1991.
9-10. Lago Azul, São Tomé, 15 m, SG, 9 mm; **11-14.** Ponto de Diego Vaz, São Tomé, 12 m, SG. **11-12.** 9.6 mm; **13-14.** 10.4 mm.
15. *Muricopsis (Muricopsis) testorii* Houart & Gori, 2008. Northwest São Tomé, Lagoa Azul, 00°24.41' N, 06°36.18' E, offshore, 37 m, on dead corals, holotype IRSNB IG.31 042/MT1977, 18.8 mm.

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Spire high with 1.5 protoconch whorls and telcoconch up to 4 or 5 broad, convex, strongly shouldered, nodose whorls. Suture adpressed. Protoconch small, whorls smooth with a narrow, strong, single keel adapically. Protoconch of holotype with a second weak shallow keel abapically, width 600-650 µm. terminal lip narrow, weakly raised, curved.

Axial sculpture of teleoconch whorls consisting of moderately high, strong, broad, nodose ribs and varices. First and second whorl with 7 or 8 ribs, third and fourth with 6 or 7 ribs, last whorls with 4 or 5 broad, moderately high varices, each with 5 small, broad, short open spines at intersection of P1-P5 spiral cords with axial varices. Spiral sculpture of moderately high, narrow primary cords: first teleoconch whorl with visible SP, P1 and P2, second with SP, P1, P2 and P3 partially covered by succeeding whorl, and several threads between primary cords. Last whorl with SP, P1-P6, ADP and occasional MP. Presence of several narrow threads between each pair of cords. P1-P4 of approximately similar size and strength, P5 and P6 narrower.

Aperture small, ovate. Columellar lip broad, lip strongly flaring abapically, adherent at adapical extremity, smooth. Anal notch deep, narrow. Outer lip erect, smooth, with 5 strong denticles within: ID, D1-D2 fused, D3, D4 and D5. Siphonal canal short, narrow, straight, weakly tapered abapically, narrowly open.

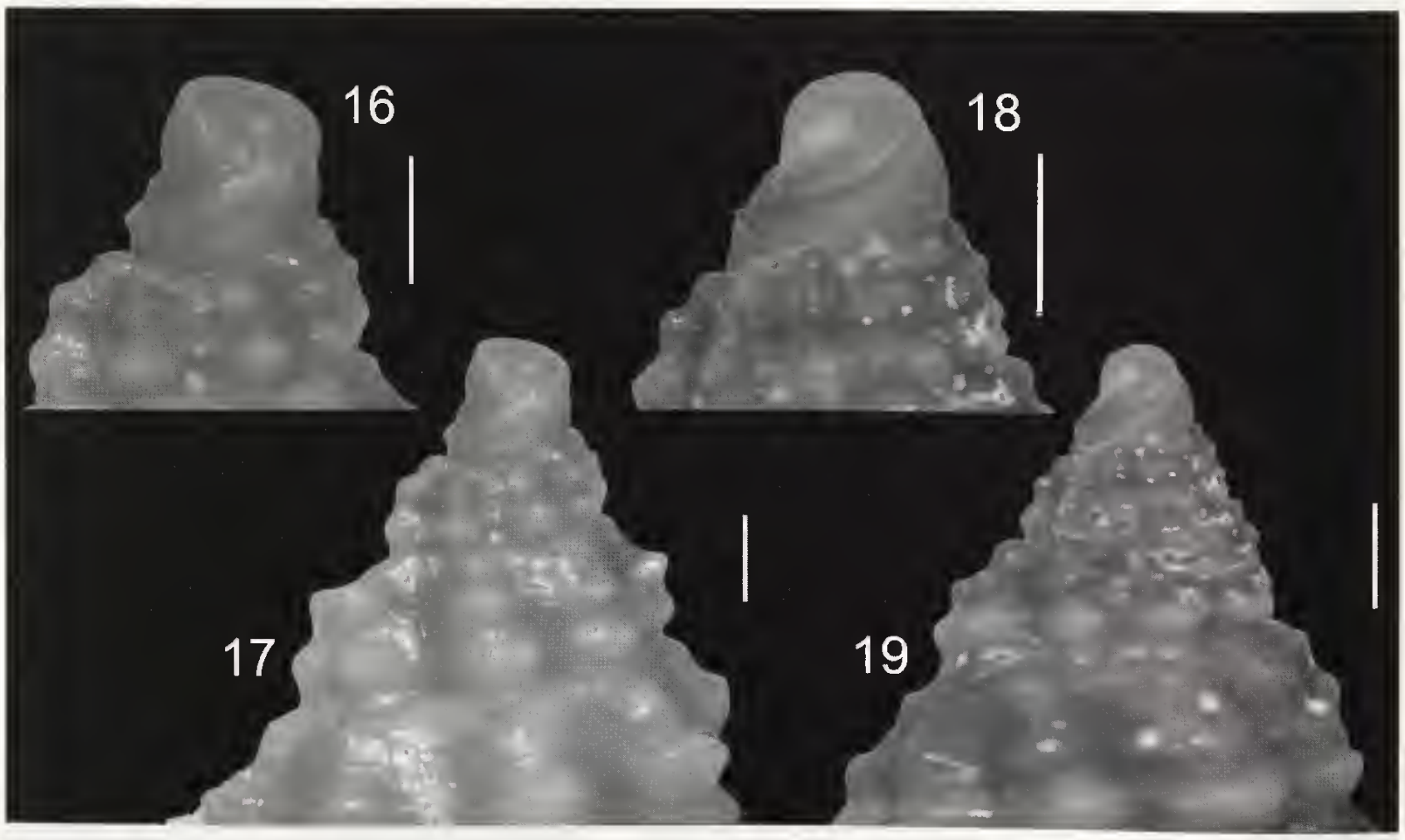
Operculum and radula unknown.

Remarks. *Muricopsis (M.) gorii* n.sp. is closely related to *Muricopsis (M.) matildeae* which lives in Sao Tomé and Príncipe and which, together with its typical form (Figs 9-10), shows a variety of shell colours from light orange to dark brown, occasionally with a white siphonal canal (Figs 11-14). However, all these forms are sympatric and the shell morphology is quite similar. Not any of these could be definitely separated from the typical shell.

Muricopsis (M.) gorii, in addition to having a bright dark orange colour, differs from *M. matildeae* in having a more strongly shouldered and angulate shell; higher and comparatively broader axial ribs on the 3 or 4 adapical teleoconch whorls and still higher and more conspicuous on the last teleoconch whorl but comparatively narrower than in *M. matildeae*; in having a less sloping subsutural ramp from second to last teleoconch whorls, and in having blunt, broad, short spines at intersection of axial and spiral sculpture while absent or low in *M. matildeae*.

Muricopsis (M.) testorii Houart & Gori, 2008 (Fig. 15), another species described from Sao Tomé is also orange coloured but differs in many ways (size and shell morphology) and doesn't need to be compared here.

The other *Muricopsis* s.s. species described from São Tomé, Príncipe and Annobon are very different and don't need to be compared either.



Figures 16-19. Protoconchs (scale bar: 0.5 mm)

16-17. *Muricopsis (Muricopsis) gorii* n. sp. **16.** Protoconch; **17.** Protoconch and first teleoconch whorls.
18-19. *Muricopsis (Muricopsis) matildeae* Rolán & Fernandes, 1991. **18.** Protoconch; **19.** Protoconch and first teleoconch whorls.

Etymology. I am particularly pleased to name this new species in honour of Sandro Gori (Livorno, Italy) who kindly donated the types and other material and who discovered many new taxa during his field trips in São Tomé and Príncipe.

ACKNOWLEDGEMENTS

I am very grateful to Sandro Gori for the opportunity he gives me to study his material and for donating specimens. Thanks also to John Wolff, Lancaster, Pennsylvania, USA, for checking the English text.

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Rolán, E. & Gori, S. 2007. A new species of *Muricopsis* (Muricidae: Muricopsinae) from São Tomé Island. *Novapex* 8(1): 23-26.

Rissoina parkeri (Mollusca: Rissooidae): a curious Caribbean species of uncertain status

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KEYWORDS. Gastropoda, *Rissoina*, Grand Cayman, Caribbean.

ABSTRACT. Two shells of a *Rissoina* with planktotrophic development found in Grand Cayman, show the problematic of its diagnosis.

Recently malacologist David Kirsh collected two specimens of a *Rissoina* in the waters of Grand Cayman Island. Each shell possess a planktotrophic protoconch (Figs 1-3) which character is not consistent with any known congener from the Caribbean (see Rolán & Fernández-Garcés, 2010).

The shells are coincident in size and sculpture with the figure and description of *Rissoina parkeri*, but have one more teleoconch whorl than the holotype of that species. This can explain why these two shells are a little larger (6.2 and 6.0 mm) than the holotype (4.4 mm).

Olsson & Harbison (1953: 327-328, pl. 48, fig. 5) described the fossil species *Rissoina parkeri* from Shell Creek, Florida, USA. The type specimen is a little immature, with the lip not fully developed. It was deposited in ANSP (19434).

In the searchable database of the Florida Museum of Natural History (FLMNH) there is a shell with Catalog Number 26545 from Glades County, Neogene of Florida.

On the Internet database Malacog 4.1.1 (Rosenberg, 2009) *R. parkeri* is tentatively treated as a synonym of *Rissoina krebsii* (Mørch, 1876). However, on examination of these two species it is evident that the latter (Fig. 5) has more ribs and spiral cords and, most important perhaps, a paucispiral protoconch (Fig. 6). Another similar species is *Rissoina multicostata* (C.B. Adams, 1850) (Figs 7-8), which likewise has many more ribs and cords but a paucispiral protoconch (Fig. 9).

The only problem is that the species *R. parkeri* was considered a fossil while the two Kirsh shells have the appearance of Recent mollusks. Given a protoconch of more than 2 ½ whorls, one must presume that if it is a Recent species it would be known from other countries in the Caribbean and this is not presently the case.

Another possibility is that this material, despite bearing the appearance of Recent shells, may be from a submarine Quarternary deposit.

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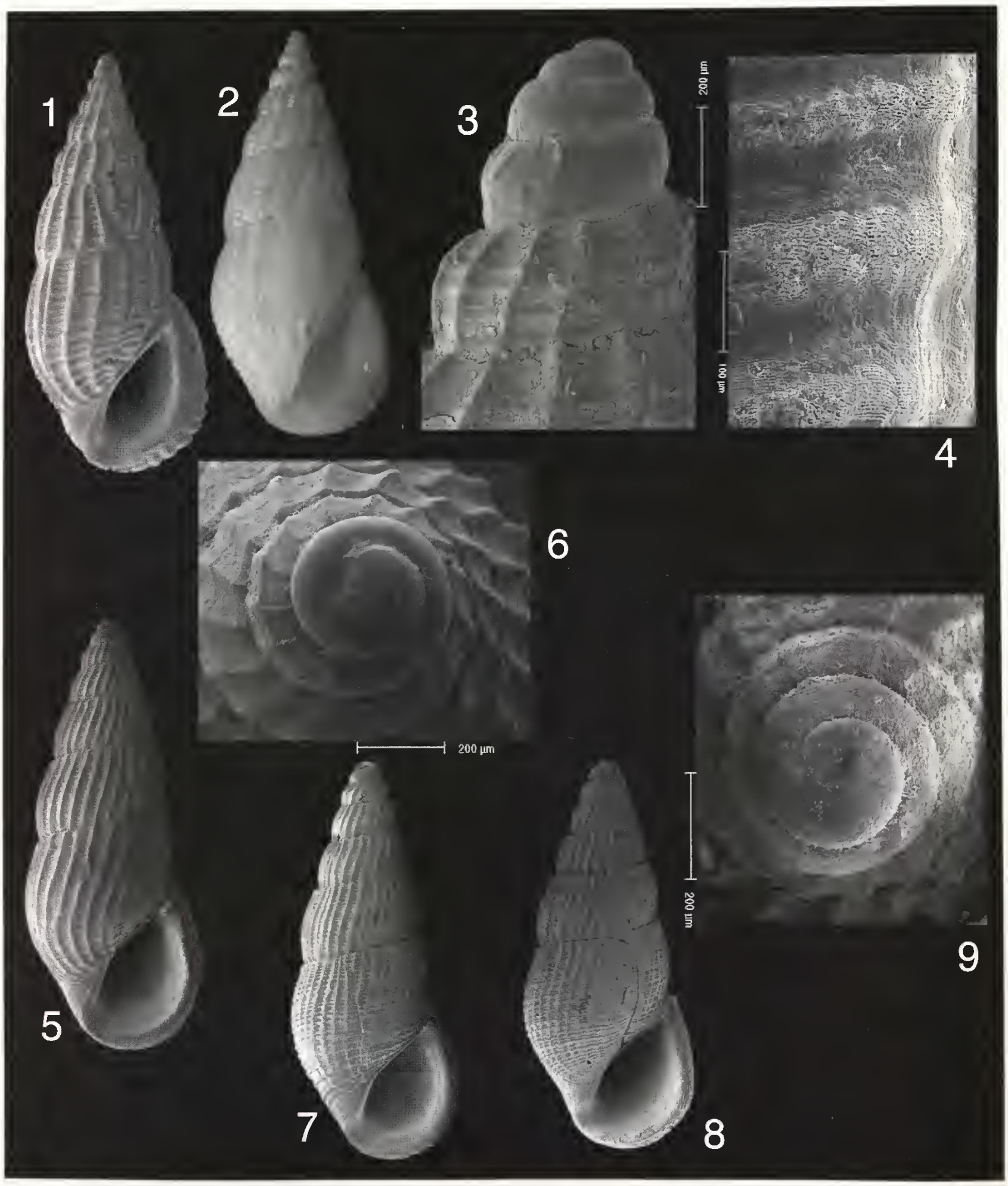
Rosenberg, G. 2009. Malacolog 4.1.1: A Database of Western Atlantic Marine Mollusca. [WWW database (version 4.1.1)] URL http://www.malacolog.org/.
Specifically:
<http://www.malacolog.org/search.php?syns=Show+Synonyms&showsynonyms=true&mode=wheresearch&wherebit=+and+(+w.originalgenus+%3D+'Rissoina'++or+w.currentfullname+like+'Rissoina+%25'+or+w.originalcombination+like+'Rissoina+%25'+or+w.originalcombination+like+'%25(Rissoina)%25')++>



Figures 1-9

1-4. *Rissoina parkeri* Olsson & Harbison, 1953
1-2. Shells, 6.2, 6.0 mm, Grand Cayman (coll. D. Kirsch); **3.** Protoconch, **4.** Microsculpture.
5-6. *Rissoina krebsii* (Mørch, 1876)
5. Shell, 4.6 mm, Cienfuegos, Cuba (MHNS); **6.** Protoconch.
7-9. *Rissoina multicostata* (C.B. Adams, 1850)
7-8. Shells, 4.0, 3.7 mm, Cienfuegos, Cuba (MHNS); **9.** Protoconch.

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Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *The Veliger* 7(I): 46-57.
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Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
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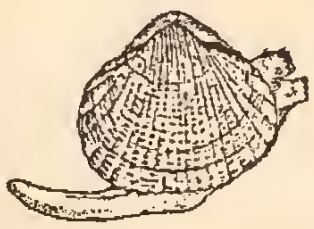

New records and description of four new species of the genus *Agathotoma* (Gastropoda, Mangeliidae) in the Caribbean

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KEYWORDS. Gastropoda, Mangeliidae, *Agathotoma*, Caribbean, new records, new species

ABSTRACT. The species collected in the Caribbean and supposedly belonging to the genus *Agathotoma* are revised. Some new records are reported and four species new to science are described.

RESUMEN. Se revisan las species recolectadas en el Caribe y supuestamente pertenecientes al género *Agathotoma*. Se refieren algunas citas nuevas y se describen cuatro especies nuevas parta la ciencia.

INTRODUCTION

The genus *Agathotoma* Cossmann, 1899 was discussed by Powell (1966), who provided a description defining all the characters of the genus. He also listed the type species and gave examples of fossil and Recent species.

In a recent paper (Fernández-Garcés & Rolán, 2010) it is mentioned that in the revision of the Turridae by Powell (1966), 561 taxa names at genus or subgenus level are mentioned, from which 89 are in Mangeliinae. More recently new genera have been described, but unfortunately these descriptions are based on minimal morphological characters with no reference to soft parts, radula, DNA or the most important characters. In our opinion it is inadvisable to create new genera without first undertaking the broader studies that are necessary to give stability and future permanence to these new taxa. Experience indicates that families with many genera based on minimal morphological characters will have to be restructured in the future, creating many synonyms and causing many changes.

In West Africa there are also species which have been considered to belong to the genus *Agathotoma* as well as to the genus *Pyrgocythara* Woodring, 1928 (see Rolán & Otero-Schmitt, 1999). The latter genus has been employed for some species recently described (Fernández-Garcés & Rolán, 2010).

For the above-mentioned reasons we will present all the species studied in this paper in a well-established genus, avoiding the use of other more recently described genera, for which we do not have complete information.

Abbreviations

ANSP: Academy of Natural Sciences of Philadelphia.
BMSM: Bailey-Matthews Shell Museum, Sanibel, Florida.
IES: Instituto de Ecología, La Habana
MCZ: Museum of Comparative Zoology, Harvard.
MNCN: Museo Nacional de Ciencias Naturales, Madrid.
MHNS: Museo de Historia Natural, Santiago de Compostela.
MNHN: Muséum national d'Histoire naturelle, Paris.
NHMUK: National History Museum United Kingdom, London.
USNM: National Museum of Natural History, Washington.
CCR: collection of Colin Redfern, Boca Raton, Florida.
CDK: collection of David Kirsh, Durham, North Carolina.
CFG: collection of Fernández-Garcés, Cienfuegos.
sp: specimen with soft parts.
s: shell.
f: fragment.
j: juvenile.

SYSTEMATICS

Superfamily **CONOIDEA** Fleming, 1822

Family **MANGELIIDAE** P. Fischer, 1883

Genus ***Agathotoma*** Cossmann, 1899
Type species: *Mangelia angusta* Jan, Miocene, Europe.

Agathotoma candidissima (C.B. Adams, 1845)
Figs 1A-F, 10A, 11A-B, Table 1

Pleurotoma candidissima C.B. Adams, 1845. *Proc. Boston Soc. Nat. Hist,* 2: 4.
Mangelia badia Reeve, 1846. Remarks in Krebs (1866): 396.
Pyrgocythara coxi in Warmke & Abbott, 1961: plate 25, fig. T.

Type material. Holotype in MCZ (186002), represented in Clench & Turner (1950, pl. 30, fig. 5) and in Williams (2006: 5510).

Type locality. Jamaica.

Other material examined. Cuba: 2 s, Guajimico, intertidal (MHNS); 2 s, Rancho Luna, Cienfuegos, 24 m (CFG); 1 s, Bajo de Sancho Pardo, 15 m (MHNS); 3 s, Rancho Luna, 20 m (MHNS); 3 s, Faro de los Colorados, Cienfuegos, 40 m (MHNS); 1 s, 1 j, Naranjo, Guajimico, Cienfuegos (MHNS); 6 s, 4 j, Itabo, Gavilán, Cienfuegos. 22°00'890"N, 80°24'832"W, 10 m (MHNS). **Nicaragua**: 2 f, Cayo Witties, 12 m (MHNS). **Bahamas**: Abaco: 14 s, 1 j, Sandy Point, intertidal (CCR); 1 s, 1 sp, Treasure Cay, 1 m (CCR); 5 s, Chub Rocks, 10 m (CCR); 27 s, 5 j, off Chub Rocks, 23 m (CCR).

Description. See C.B. Adams (1845) and Clench & Turner (1950). The protoconch has a diameter of about 400 µm, with about 2.25 whorls; the first part (about 1.75 whorls) is smooth but immediately small ribs begin in the suture and are complete on the last half whorl.
The colour is white or cream, sometimes with two brown lines in the middle of the last whorl (Fig. 10A).
Dimensions: Up to 5 mm in length.

Distribution. Throughout the Caribbean. Some references can not be included due to doubtful determination of the species.

Remarks. This is the older species in this group described from the Caribbean. The first problem is its generic placement. In a recent work by Fernández-Garcés & Rolán (2010) this species was referred to the genus *Pyrgocythara* Woodring, 1928. However this is open to discussion, as no more information on soft parts is available. In the present work we have decided to place it provisionally in *Agathotoma,* following most authors and databases.

We have had many doubts about the assignment of *A. candidissima* made by several authors, as for example Leal (1991: pl. 24A), and also García (2008: fig. 23) who reproduced the figure of the previous author. These figures presented a shell with the upper extreme of the axial ribs very prominent which is not in accordance with the figure of the type represented in Clench & Turner (1950); on the contrary these shells are more coincident with the morphology of the species we will mention below as *A. castellata.*
Pyrgocythara coxi Fargo, 1953 appears in Williams (2006) as a synonym of *A. candidissima.* We think that it is not, as the holotype of *A. coxi* shows axial ribs narrower than those on the typical *A. candidissima.*
In De Jong & Coomans (1988: figure 604A, p. 264) the shell presented as *A. candidissima* is not this species and the shell figured in fig. 604B is also dubious.
The shell figured here (Figures 1A, 10A) has the typical profile.
The species is correctly represented on some internet sites - (Conchologist Forum and Femorale, for example).

Agathotoma ecthymata García, 2008
Figs 2A-G, 10B-D, 11C, Table 1

Agathotoma ecthymata García, 2008. *Novapex*, 9(1): 3, figs. 10-18.

Type material. Holotype in ANSP (416412) (represented in the original description).

Type locality. Abaco, Bahama Islands.

Other material examined. Cuba: 4 s, Cañón de la Bahía, Cienfuegos, 12 m (CFG); 3 s, Los Laberintos, Cienfuegos, 20 m (CFG); 6 s, Rancho Luna, Cienfuegos, 24 m (CFG); 9 s, 2 j, Rancho Luna, Cienfuegos, 15 m (MHNS); 4 s, 3 j, Rancho Luna, Cienfuegos, 18 m (MHNS); 1 j, Cayo de Sancho Pardo, 12 m (MHNS); 1 s, Punta del Diablo, Gavilán, Cienfuegos, 21°57'796"N, 80°24'784"W, 20 m (MHNS); 11 s, 3 j, Bajo de Sancho Pardo, 15 m, (MHNS); 2 s, La Habana, 5 m (MHNS); 2 s, Itabo, Gavilán, Cienfuegos. 22°00'890"N, 80°24'832"W, 10 m (MHNS). **Nicaragua**: 4 s, 5 j, Cayo Witties, 12 m (MHNS). **Mexico**: 4 s, 2 j, Puerto Morelos, Yucatán, 12 m (MHNS). **Bahamas**: Abaco: 12 s, Treasure Cove, intertidal (CCR); 5s, 1 sp, Treasure Cay, 1 m (CCR); 4 s, Shell Island, Guana Cay, intertidal (CCR); 1 sp, Fish Cays, 3 m (CCR); 1 j sp, Guana Cay, 3.5 m (CCR); 2 sp, 1 j sp, Scotland Cay, 2.5 m (CCR); 1 sp, Don't Rock, 3.5 m (CCR).

Description. See García (2008). In the original description the protoconch is mentioned as having 1.5 whorls, but following the Verduin method (Verduin, 1976) which we usually employ, it has only a little

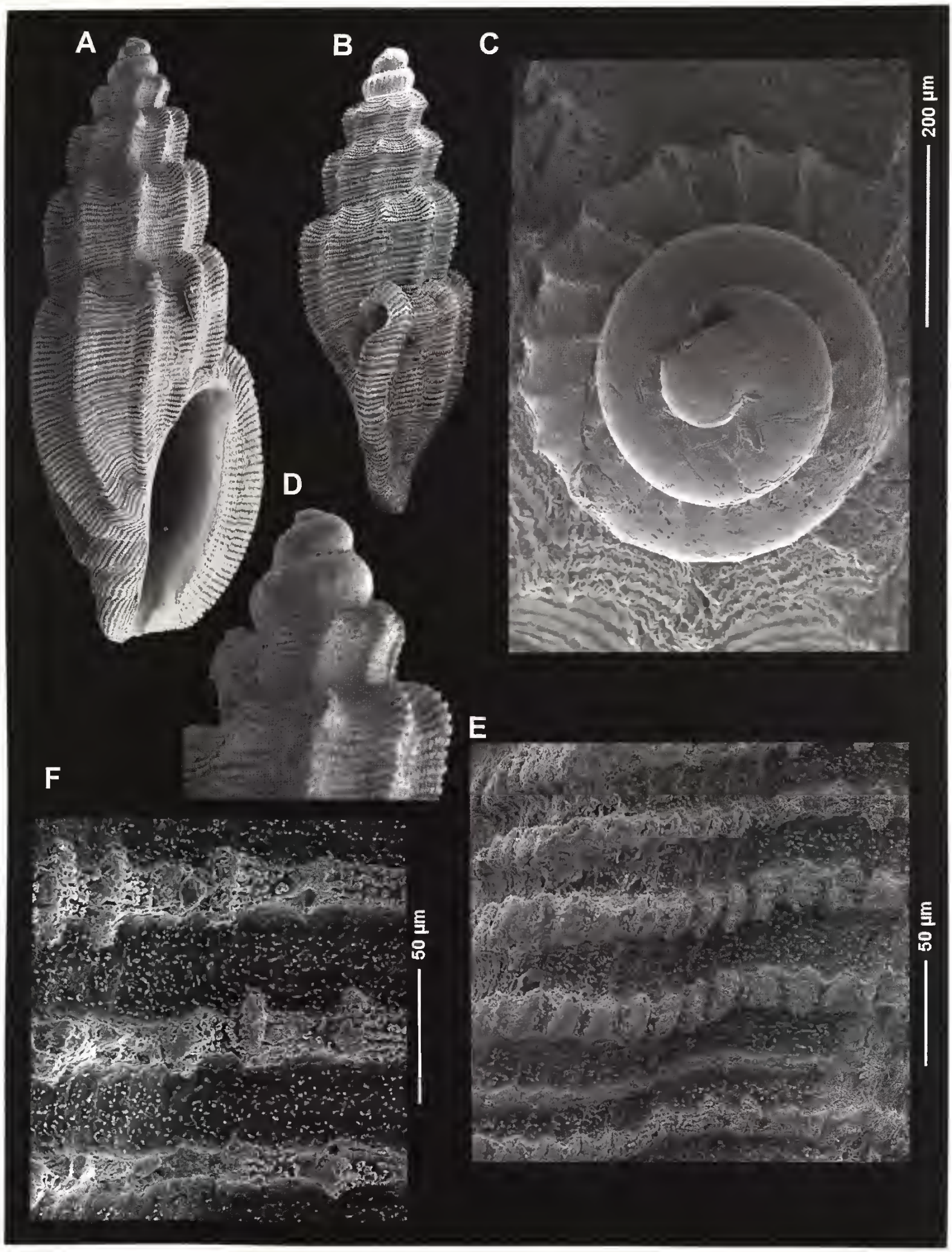

Figure 1. A-F. *Agathotoma candidissima* (C.B. Adams, 1845). **A**. shell, 4.7 mm, Faro de los Colorados, Cienfuegos, Cuba (MHNS); **B**. shell, 3.4 mm, María la Gorda, Cuba (MHNS); **C-D**. protoconch; **E-F**. microsculpture and detail.

more than one whorl and does not reach 1.25 whorls. Also García (2008) did not mention the dimensions of the protoconch, which we calculate to be between 320 to 340 µm in the figures. The protoconchs of our material are approximately 350-370 µm in diameter.

Distribution. In García (2008) it is recorded from: Bahamas, Belize, British Virgin Islands, Colombia. This is the first record for Cuban, Nicaraguan and Mexican waters.

Remarks. Most of our material is consistently smaller than the shell figured by García (2008), but the microsculpture of the protoconch and the teleoconch seems to be similar.
We show the microsculpture with better detail (Figs. 2F-G).
A. candidissima is more elongate, less robust, the shoulder is rounded and not so angular, and the protoconch has almost 2.25 whorls.

Agathotoma apocrypha (García, 2008)
Figs 3A-F, 11D, Table 1

Suturocythara apocrypha García, 2008. *Novapex*, 9(1): 3, figs. 33-36.

Type material. Holotype in ANSP (416415) (represented in the original description).

Type locality. Bahía de Campeche, SW Gulf of Mexico.

Other material examined. Cuba: 10 s, Faro Luna, Cienfuegos, 22 m (CFG); 1 s, Faro de los Colorados, 30 m (MHNS); 6 s, Rancho Luna, Cienfuegos (MHNS); 1 s, Bajo de Sancho Pardo, 12 m (MHNS); 1 s, Punta del Diablo, Gavilán, Cienfuegos, 21°57'796"N, 80°24'784"W, 20 m (MHNS). **Mexico**: 3 s, Puerto Morelos, Yucatán, 12 m (MHNS).

Description. See García (2008). The protoconch is mentioned in the original description as having 1.25 whorls, which agrees with our shells. In that work the dimensions of the protoconch were not mentioned, which we calculate to be about 470 µm in the figures. The protoconchs of our material are approximately 400-430 µm in diameter. Otherwise, the microsculpture seems to be similar, although the zigzag lines are not as well-defined as in our shells.
The microsculpture of the teleoconch is shown in our plates.

Distribution. In the original description, García (2008) records this species from the southwestern Gulf of Mexico, the southeast coast of Florida and south of Belize. This is the first record for Cuban waters.

Remarks. In spite of the differences in the size of the protoconch and the microsculpture, we consider our material to be the same species. The shells are very similar to the type species of the genus, *Agathotoma angusta* (Jan) Bellardi, 1848 represented in Powell (1966: pl. 15, fig. 15), being even more similar to the type species than the shells of *Agathotoma candidissima*.
We figure with better detail the microsculpture of both the protoconch and the telcoconch in Figures 3E-F.
The species presented above are very different in profile and microsculpture, also with protoconch differences. The most similar protoconch is that of *Agathotoma ecthymata* but the microsculpture has minute tubercles aligned spirally.

Agathotoma castellata (E.A. Smith, 1888)
Figs 4A-G, 10E-F, 11E, Table 1

Pleurotoma (Mangilia) castellata E.A. Smith, 1888: 312-313.
Pyrgocythara candidissima in RIOS (1994): 175, fig. 806.

Type material. The lectotype of *A. castellata* is in BMNH (1854.6.30.136-7) and was designated by Kilburn (1993: fig. 71); also it was represented by KAICHER (1984), as *Agathotoma costellata* (sic), and in Williams (2006).

Type locality. Unknown.

Material studied. Cuba: 4 s, Faro de los Colorados, Cienfuegos, 20-35 m (MHNS); 5 s, 2 j, Rancho Luna, 20-35 m (MHNS); 5 s, Faro Luna, Cienfuegos, 22 m (CFG); 2 s, Los Laberintos, Faro Luna, Cienfuegos. 22°02'039"N, 80°25'792"W, 10 m (MHNS); 1 s, Comodoro Beach, 8-10 m (MHNS). **Bahamas**: Abaco: 17 s, Sandy Point, intertidal (CCR); 1 j, off Guana Cay, 60 m (CCR); 7 s, 2 j, off Chub Rocks, 23 m (CCR); 1 s, Sandy Cay, 7 m (CCR).

Description. Shell broadly ovoid, spire with turreted profile, solid, pointed, cream in colour with 4-5 irregular spiral brown bands sometimes faded partially or totally. Protoconch with 2.25 whorls, a diameter of about 500 µm, a nucleus of about 100 µm, 1.5 smooth whorls and the last ¾ bearing about 20 curved axial ribs. Teleoconch of about 3 - 4 whorls, all having a very prominent subsutural shoulder with the upper part of the whorls almost horizontal. Each whorl has about 7-8 almost orthocline or slightly opisthocline axial ribs, more prominent on the shoulder and much narrower than their interspaces. Spiral sculpture of very numerous and variable cordlets (about 14-16 on the first whorl), 20-22 on the second, 22-23 on the third and more than 60 on the body whorl, sometimes with intervening cordlets developing. Under high magnification the cordlets can be seen to be rugose, bearing numerous rounded rough nodules which

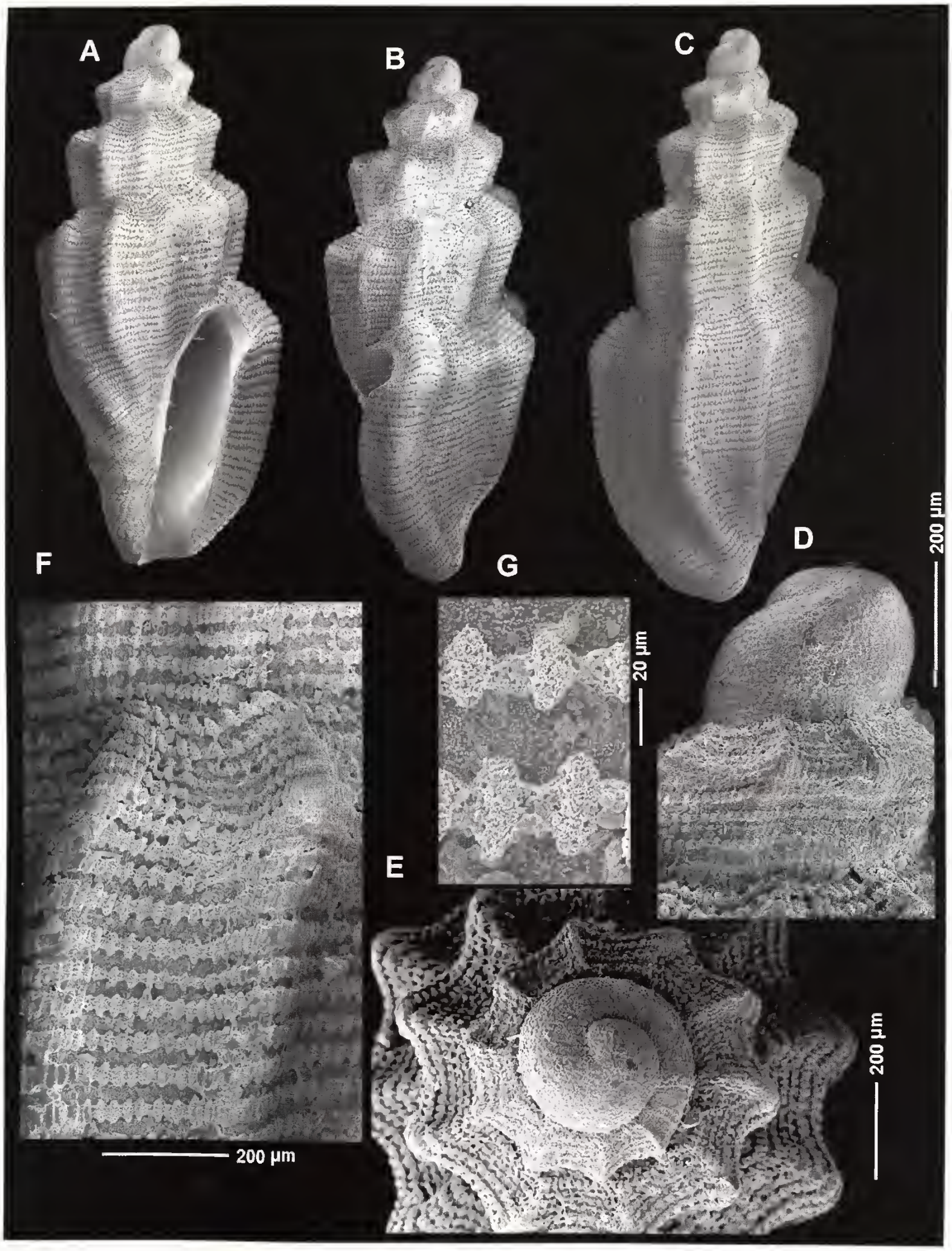

Figure 2. A-G. *Agathotoma ecthymata* García, 2008. **A-C**. shells, 3.0, 3.1, 3.4 mm, Los Laberintos, Cienfuegos (MHNS). **D-E**. protoconch. **F-G**. microsculpture and detail.

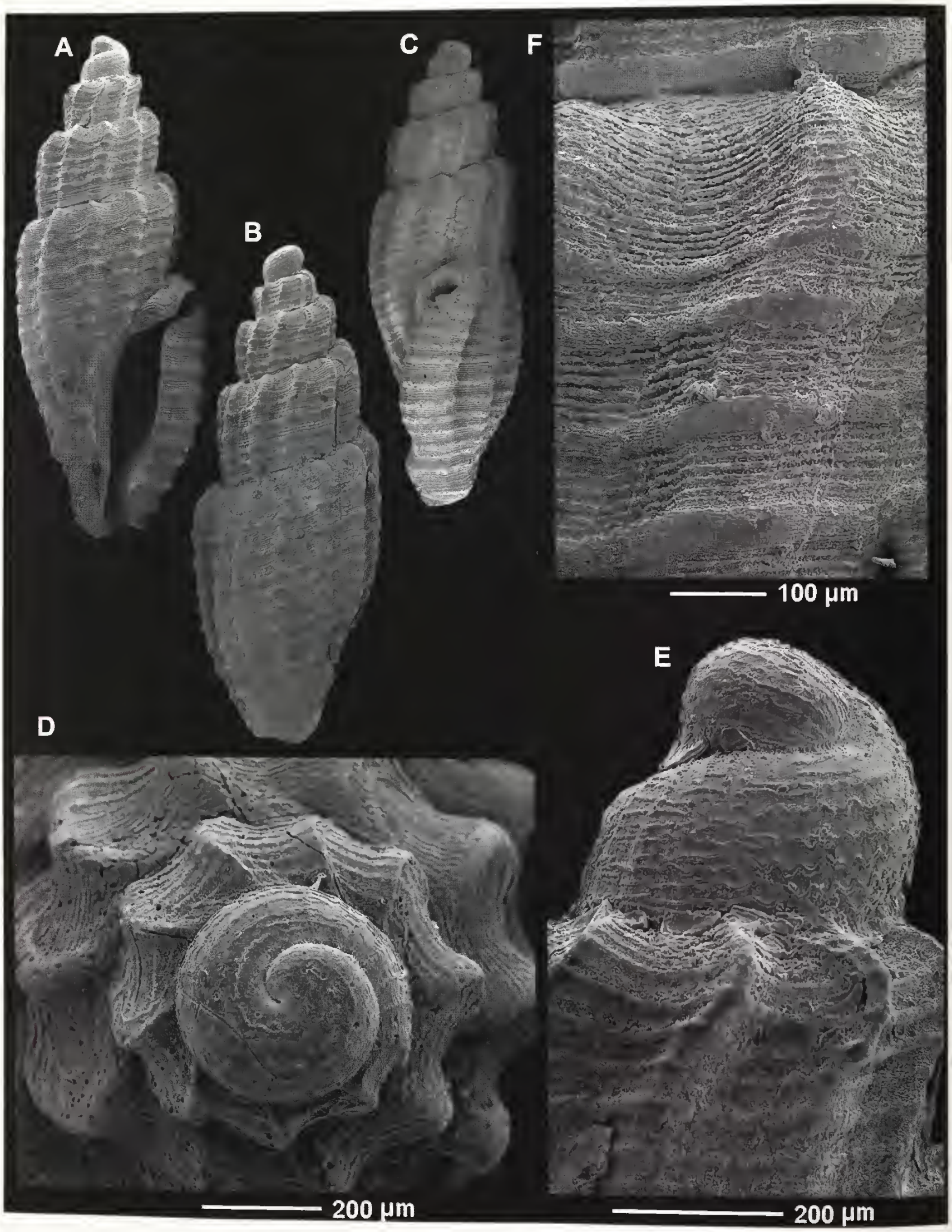

Figure 3. A-F. *Agathotoma apocrypha* (García, 2008). **A-C**. shells, 3.8, 3.7, 3.5 mm, Cienfuegos (MHNS); **D-E**. protoconchs; **F**. microsculpture.

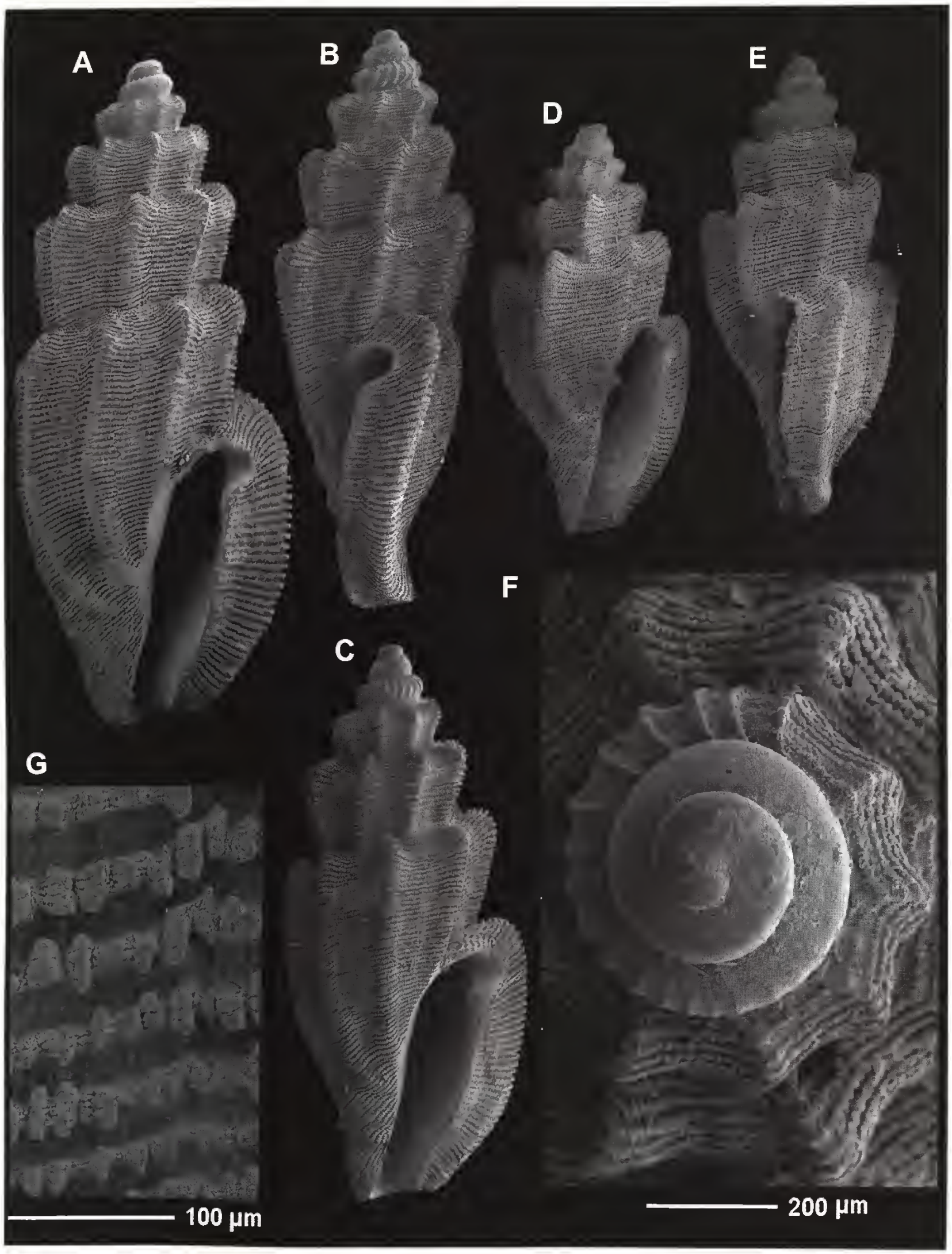

Figure 4. A-G. *Agathotoma castellata* (E.A. Smith, 1888). **A**. shell, 5.2 mm, Abaco, Bahamas (CCR); **B-C**. 3.9, 4.0 mm, Faro de los Colorados (MHNS); **D-E**. juvenile, 2.6, 3.2 mm, Rancho Luna (MHNS); **F**. protoconch; **G**. microsculpture.

overlap the interspaces; in the interspaces there are numerous irregular minute microtubercles. Aperture elongate-oval, extended by a wide and short siphonal canal; on the upper part a relatively deep sinus, with a tubercle on its lower edge. Microsculpture of the shell extends onto a wide thickened peristome.

Dimensions: The lectotype is 6.5 mm in length. The material studied from Cuba and Bahamas is smaller.

Distribution. This species has been recorded from the Caribbean (Rosenberg, 2009) and from Cuba in the present work. It was also recorded (as *A. candidissima*) from the Bahamas (Redfern, 2001: fig. 537A) and Brazil (Leal, 1991: pl. 24, fig. A), with the latter figure reproduced by Rios (1994: 175, fig. 806) and García (2008: fig. 23).

Remarks. It is evident that this species is rather variable:

1- The axial ribs of the lectotype of *A. castellata* are very narrow (interspaces 4-5 times wider) while in most of our shells the interspaces are only 2-3 times wider.
2- Usually the ribs extend above the level of the suture, a feature which is more evident in juvenile shells.
3- The lectotype of *A. castellata* measures 6.5 mm in length for a shell with 4 teleoeonch whorls, while we have shells with the same number of whorls and a length of only 4-5 mm.
4- The siphonal canal of *A. castellata* is relatively shorter in larger shells.

With regard to the confusion of the present species with *A. candidissima*, we must point out that the latter is narrower, more elongate, the rounded upper part of the axial ribs is less pronounced , the axial ribs never extend above the sutural level and the colour is whitish with narrow brown bands.
Both species are present in Cuba and we have never found any intergradations between them, and so we consider them to be different species.

Agathotoma kirshi spec. nov.
Figs 5A-H, 11F, Table 1

Type material. Holotype (Figs. 5A-D) deposited in BMSM (17948) (Ex-CCR 10498). Paratypes: CDK (1 s) (Fig. 5E), Pelican Point, North Caicos, intertidal; MNHN (24829, 1 s) (Fig. 5F), from Sandy Cay, Abaco, Bahamas, 7 m.

Type locality. Chub Rocks, Abaco, Bahamas, under a rock, 12 m.

Other material examined. Nicaragua: 1 s, 1 f, Cayo Witties, 20 m (MHNS).

Description. Shell with ovoid elongate profile, slightly turreted, rather solid, pointed, white in colour with 2 spiral bands formed by isolated brown blotches, mainly evident on the ribs. Protoconch with only a little more than 1 whorl, with a diameter of about 480 µm, being totally covered by very small rounded tubercles spirally aligned. Teleoconch of about 5-5.5 whorls, with a rounded shoulder close to the upper suture. Each whorl has about 7 almost orthocline or slightly opisthocline ribs, more prominent on the shoulder and narrower than their interspaces. On the last ½ whorl, the axial ribs may be absent. Spiral sculpture of very numerous and variable cordlets (between 15-20 on the first whorl), with additional intervening ones developing, numbering about 24 on the second, 27 on the third and more than 70 on the body whorl. Under high magnification the cordlets can be seen to be rugose, bearing numerous rounded rough nodules that are axially elongate and overlap the interspaces; in the interspaces there are numerous irregular minute microtubercles. Aperture oval elongate, extended by a wide and short siphonal canal; on the upper part a shallow sinus. Peristome wide, with the same microsculpture as the shell.
Dimensions: The holotype is 8 mm in length.
The soft parts examined in a specimen from Abaco (Bahamas) (Figs. 5 B-D) are whitish and slightly translucent, with a few milk-white spots at the end of the siphon and with the eyes very close to the end of the tentacles.

Distribution. Known from the Bahama Islands and Turks and Caicos Islands. A shell from Nicaragua is probably this species, but is not in good enough condition for a definitive comparison.

Remarks. *Agathotoma kirshi* spec. nov. is the largest of the species studied in the present work. Axial ribs may be obsolete on the last whorl. The persistence of a previous apertural thickening seems to be frequent.
Agathotoma candidissima is smaller, shorter, without former varices, the protoconch has more whorls, the colour is whitish.
Agathotoma ecthymata is more robust, the shoulder is more prominent, the axial ribs wider, the last whorl straighter towards the base, the protoconch is narrower and less elevated.
Agathotoma apocrypha is smaller, the axial ribs more numerous and wider, the microsculpture has cords alternating with cordlets, the protoconch has zigzag lines.
Agathotoma castellata is smaller, relatively wider, with the axial ribs prominent and surpassing the level of the suture; the protoconch has 2.5 whorls.

Etymology. Named after David Kirsh, who collected the shell from North Caicos and loaned it to us for study.

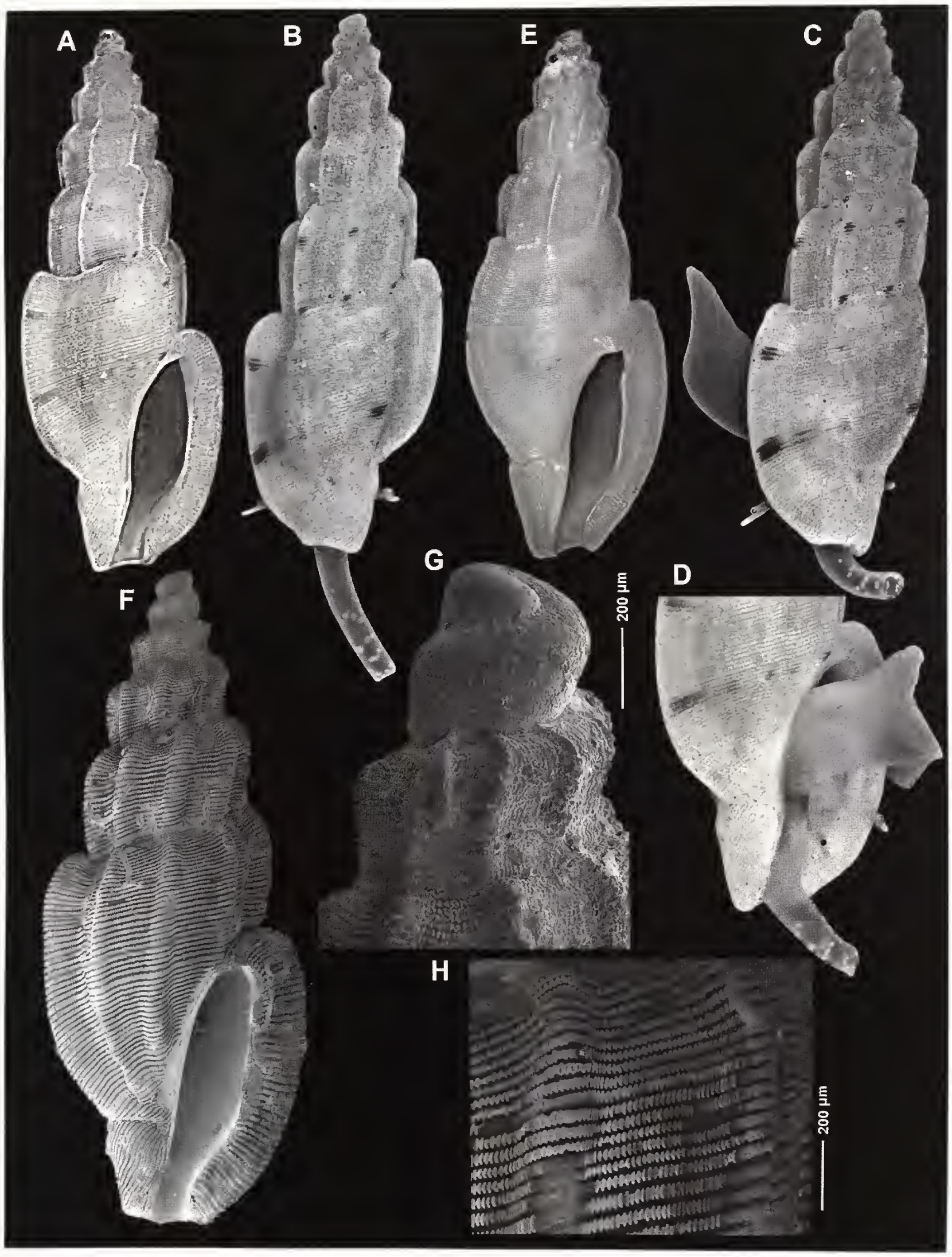

Figure 5. A-H. *Agathotoma kirshi* spec. nov. **A-D**. holotype, 8 mm (BMSM); **A**. shell; **B-D**. holotype with soft parts; **E**. paratype, 9 mm, North Caicos (CDK); **F**. paratype, 7 mm, Sandy Cay, Abaco, Bahamas (MNHN); **G**. protoconch, from figure F; **H**. microsculpture.

Agathotoma asthenika spec. nov.
Figs 6A-E, 10G, 10K-L, 11G, Table 1

Type material. Holotype (Fig. 6A) in the MNCN (15.05/60008). Paratypes in the following: MNHN (24830, 1 s); from the type locality; MHNS (100567, 1 s), IES (1 s); CFG (1 s) and CCR (1 s), both from Faro de los Colorados, Cienfuegos, 40-65 m; USNM (1 s), La Habana, 12 m.

Other material examined. Cuba: 1 s, Rancho Luna, 22 m, broken during the study; 3 s, Los Laberintos, Faro Luna, Cienfuegos 22 m (CFG); 5 s, Los Laberintos, Faro Luna, Cienfuegos, 22°02'039"N, 80°25'792"W, 10 m (CFG); 4 s, 1j, Bajo de Sancho Pardo, 15 m (MHNS).
Type locality. Los Laberintos, Faro Luna, Cienfuegos, 30 m, Cuba.

Description. Shell ovoid-elongate, rather solid, pointed, white with some tan areas between the ribs and also in the sutural area. Protoconch of a little more than 2 whorls, the first one and a quarter whorls smooth and the last half axially ribbed. Diameter of about 410 µm. Teleoconch of about 4 whorls, with a slightly prominent shoulder a short distance below the suture. Each whorl has 8-9 prominent orthocline or slightly opisthocline ribs, a little prominent on the shoulder and narrower than their interspaces. Spiral sculpture of very numerous and irregular cordlets (about 10 on the first whorl, about 11-12 on the second and 40 to 55 on the body whorl). High magnification reveals very fine lines in the interspaces which form axially elongate nodules when crossing the cordlets. In the interspaces there are also numerous irregular micro-tubercles. Aperture oval elongate extended by a wide and short siphonal canal and with a deep sinus on its upper part. Peristome wide, with the same microsculpture as the shell.
Dimensions: The holotype is 3.9 mm in length . Other material studied is between 3-4 mm in length.

Distribution. Only known from Cuba.

Remarks. *A. candidissima* is larger, a little wider, more solid, the shoulder is less pronounced and rounded, the colour is white sometimes with faded spiral bands and lacks subsutural colour. *A. candidissima* is a slightly variable species, but it is not possible that these shells could represent a population of narrow shells because typical shells of both species have been collected in the same area without intergradations.
Agathotoma ecthymata is wider and more robust, and has a paucispiral protoconch.
Agathotoma apocrypha is wider, mainly on the base, the spiral sculpture has larger cordlets and the protoconch is short and strongly sculptured by zigzag cords.
Agathotoma castellata is wider, with axial ribs which are more elevated in the subsutural area.

Etymology. The specific name is derived from the Greek word "*asthenikós*" which means "thin, sickly" alluding to its narrow profile.

Agathotoma eduardoi spec. nov.
Figs 7A-G, 10H, 10M-N, 11H, Table 1

Type material. Holotype (Fig. 7A) in the MNCN (15.05/60009). Paratypes in the following: MNHN (24831, 1 s, Fig. 7B, 11D); MHNS (100568, 5 s, Fig. 7C, 11C), IES (1 s); CFG (1 s) all paratypes from Rancho Luna, Cuba.

Other material examined. Cuba: 2 s, Itabo, Gavilán, Cienfuegos, 22°00'890"N, 80°24'832"W, 10 m (MHNS); 1 s, Rancho Luna, Cienfuegos 20 m (CFG).

Type locality. Cayo Witties, 12 m, Nicaragua.

Description. Shell ovoid-elongate, rather solid, pointed, whitish in colour. Protoconch with a little more than one whorl, appearing smooth, but magnification reveals numerous spirally aligned tubercles; diameter of about 380-400 µm. Teleoconch of about 4 whorls in most mature specimens, with a slightly prominent shoulder a short distance below the suture. Each whorl has prominent orthocline or slightly opisthocline ribs, nine on the first whorl and about ten on the subsequent whorls, the ribs being narrower than their interspaces. Spiral sculpture of very numerous and irregular cordlets (about 10 on the first whorl, about 14 on the second and between 45-50 on the body whorl). High magnification reveals very fine lines in the interspaces which form axially elongate nodules when crossing the cordlets, with an irregular microsculpture. In the interspaces there are also numerous irregular micro-tubercles. Aperture oval elongate extended by a wide and short siphonal canal and with a deep sinus on its upper part. Peristome wide, with the same microsculpture as the shell.
Dimensions: The holotype is 4.2 mm in length. Other material studied is between 2-4 mm in length.

Distribution. Known from Cuba and Nicaragua.

Remarks. The differences with the species previously mentioned are very similar to those discussed for *A. asthenika* spec. nov., as both shells are very similar except for the different shorter protoconch.
Agathotoma candidissima is larger, a little wider, more solid, the shoulder is less pronounced and rounded, the colour is white sometimes with faded spiral bands, lacks subsutural color, and has a protoconch with more whorls.

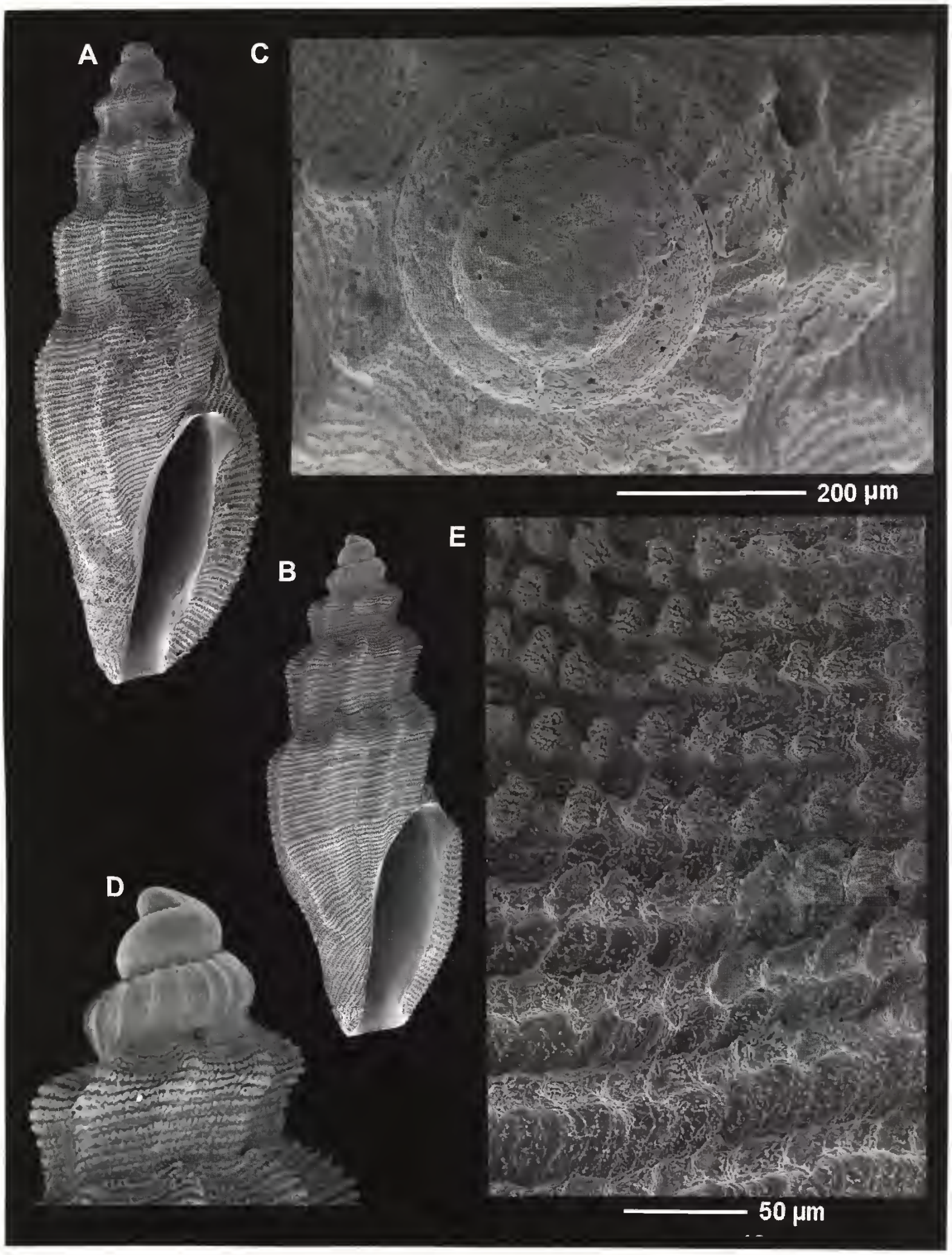

Figure 6. A-E. *Agathotoma asthenika* spec. nov. **A**. holotype, 3.9 mm, Los Laberintos, Faro Luna (MNCN); **B**. juvenile, 3.0 mm, Maria la Gorda (MHNS); **C-D**. protoconch; **E**. microsculpture.

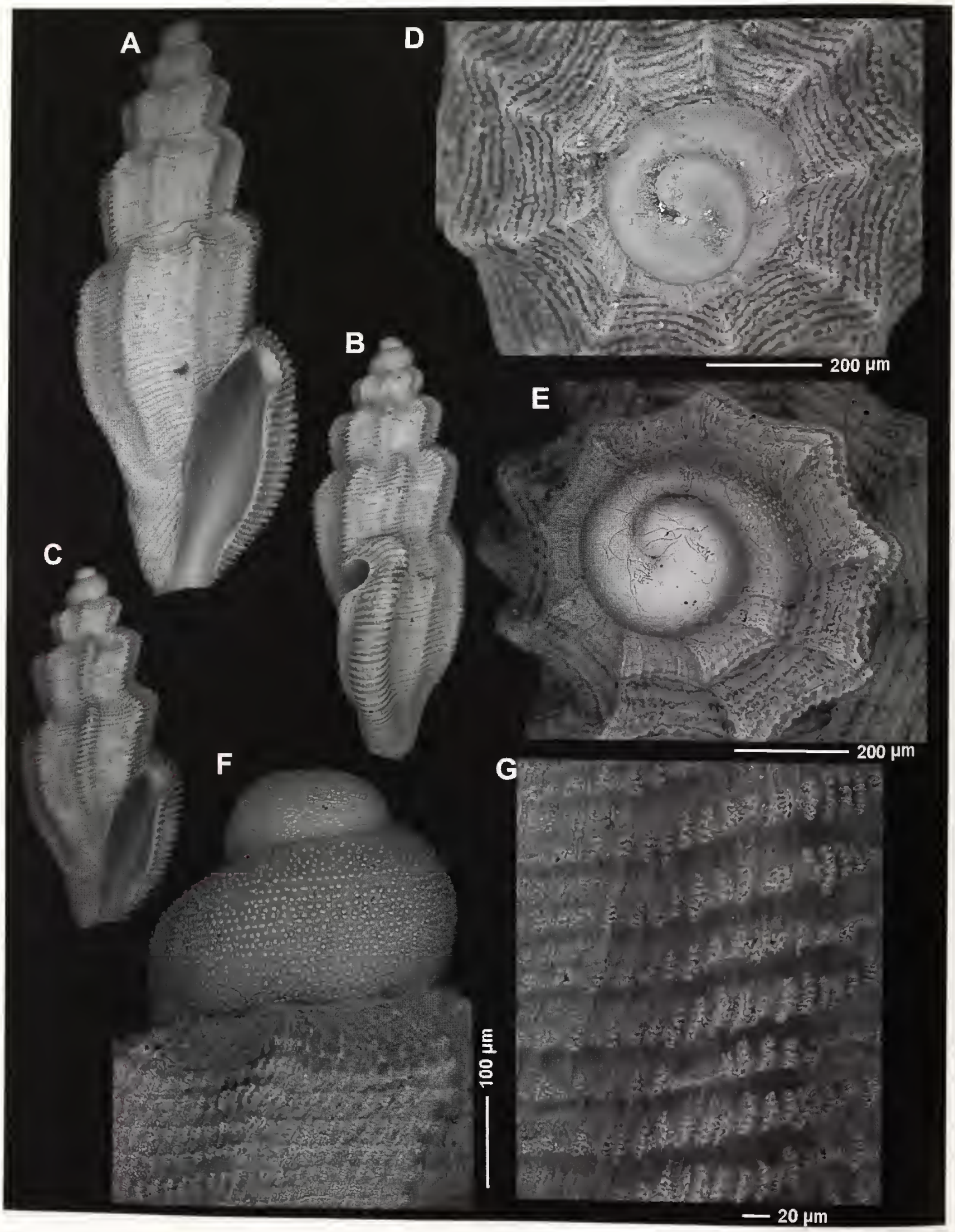

Figure 7. A-G. *Agathotoma eduardoi* spec. nov. **A**. holotype, 4.2 mm, Cayo Witties, Nicaragua (MNCN); **B-C**. paratypes, 3.7 mm (MNHN), 3.3 mm (MHNS), from Rancho Luna, 10-30 m; **D**. protoconch, from Witties, Nicaragua; **E-F**. protoconchs from Rancho Luna, Cuba. **G**. microsculpture.

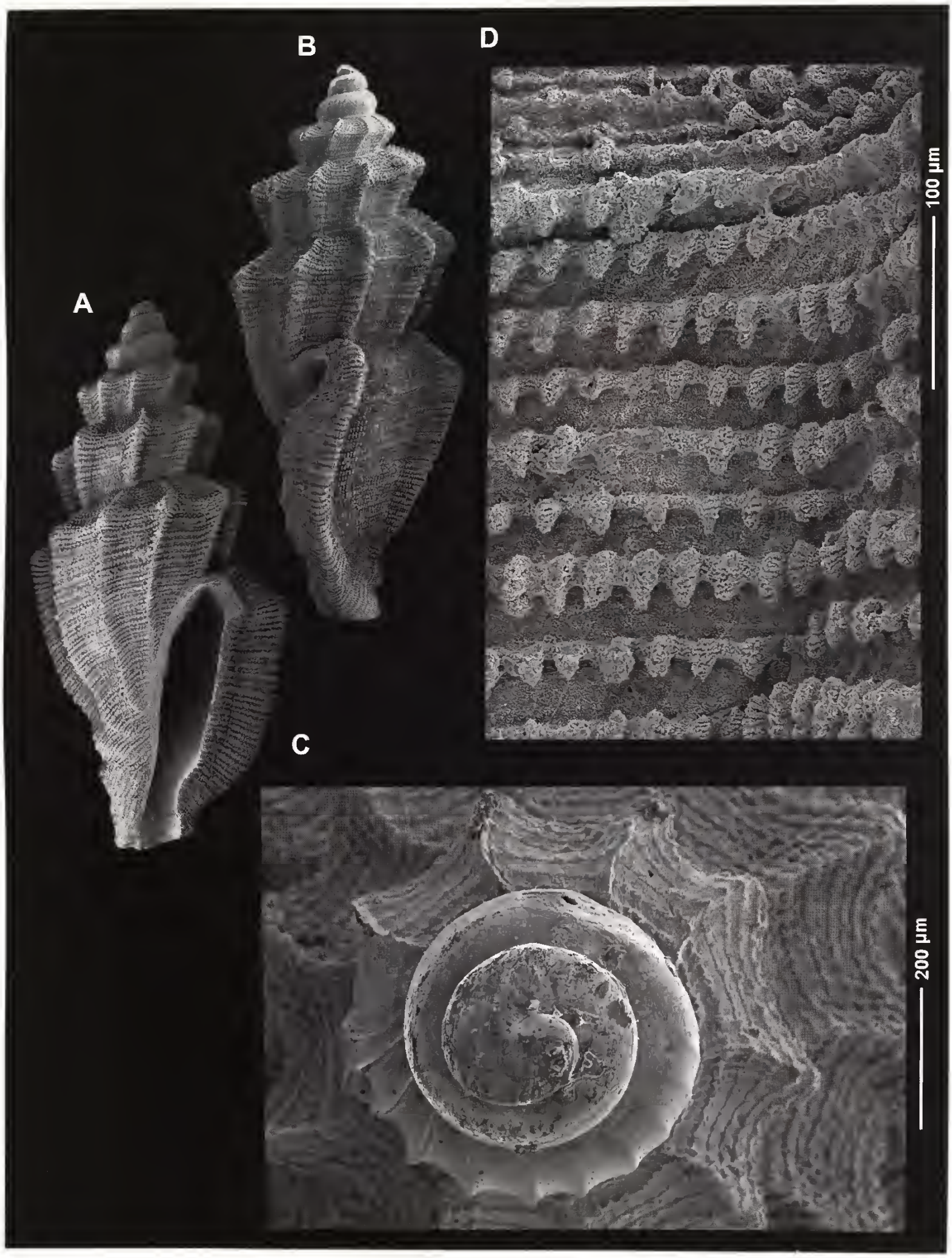

Figure 8. A-D. *Agathotoma prominens* spec. nov. **A**. holotype, 4.1 mm, (MNCN); **B**. paratype, 4.3 mm (MNHN), Faro de los Colorados; **C**. protoconch; **D**. microsculpture.

Agathotoma ecthymata is wider and more robust, the shoulder more angular, and its protoconch is rather similar but a little narrower and its tubercles are more dense.
Agathotoma apocrypha is wider, mainly on the base, the spiral sculpture has larger cordlets and the protoconch is sculptured by zigzag cords.
Agathotoma castellata is wider, with axial ribs which are more elevated in the subsutural area and the protoconch has more whorls.
Agathotoma kirshi spec. nov. has a larger shell, wider and more sculptured, and the axial ribs do not have a clear shoulder.
Agathotoma asthenika spec. nov. has a rather similar shell, but it has a very different protoconch with a little more than 2 whorls, the first one smooth.

Etymology. The specific name honours Eduardo Nápoles Fernández, grandson of the second author.

Agathotoma prominens spec. nov.
Figs 8A-D, 10I-J, 11I, Table 1

Type material. Holotype (Fig. 8A, 10I), in MNCN (15.05/60010); Paratypes: MNHN (24832, 1 s, Fig. 8B, 10J), MHNS (100569, 3 s), IES (2 s), USNM (1 s), CFG (2 s), all from the type locality; CFG (3 s) Cañón de la bahía de Cienfuegos, 12 m; (2 s), Faro Luna, 20 m; CCR (1 s), Bajo de Sancho Pardo, 15 m; MHNS (100569, 2 s), from Cayo María la Gorda, 12 m; (100569, 1 s), Cayo Witties, 12 m, Nicaragua.

Type locality. Faro de los Colorados, Cienfuegos, 20 m, Cuba.

Other material examined. **Cuba**: 2 s, 1 j, Itabo, Gavilán, Cienfuegos. 22°00'890"N, 80°24'832"W, 10 m (MHNS); 1 s, 5 f, Rancho Luna, Cienfuegos, 10-20 m (MHNS). **Nicaragua**: 1 f, Cayo Witties, 12 m. **Bahamas**: Abaco: 1 s, Sandy Cay, 7m.

Description. Shell with rhomboidal profile, solid, pointed, cream with three irregular spiral brown bands.
Protoconch with 2.25 whorls, a diameter of about 510 µm, a nucleus of about 100 µm, the last ½ whorl with 11 curved axial ribs, the rest being smooth. Teleoconch of about 3.5 whorls, which have a prominent and angular shoulder just below the suture. Each whorl has prominent, almost orthocline ribs, prominent on the shoulder and narrower than their interspaces. Spiral sculpture of numerous and variable cordlets (about 15 on the first and more than 60 on the body whorl). High magnification shows the cordlets to be rugose, bearing numerous axially elongate nodules which mainly overlap the interspace below. Interspaces sometimes with fine growth lines and numerous irregular minute micro-tubercles. Aperture oval elongate, extended by a short siphonal canal that is wide at the base but constricted above; also with a deep sinus on the upper part. Peristome wide, with the same microsculpture as the shell.
Dimensions: The holotype is 4.1 mm in length. One paratype reaches 5.2 mm in length.

Distribution. Only known from Cuba, Nicaragua and the Bahamas.

Remarks. Comparison may be made with the following species:
Agathotoma candidissima is usually larger, a little wider, more rounded in profile, the shoulder is less pronounced and not angular, the colour is white sometimes with faded spiral bands.
Agathotoma ecthymata is wider at the base, more robust, the ribs are a little prominent but less angular, and has a paucispiral protoconch.
Agathotoma apocrypha is narrower, wider at the base, the shoulder less prominent and the spiral sculpture has larger cordlets; the protoconch is short and strongly sculptured by zigzag cords.
Agathotoma castellata is usually smaller, narrower, the shoulder is less prominent and the ribs are more elevated; the colour does not form spiral bands.
We include images (Figs. 9A-B, 10O) of *Glyphoturris rugirima* (Dall, 1889) with a detail of the microsculpture (Fig. 9C). It can appear similar to the species here described, but differs due to its very irregular and prominent spiral cords.

Etymology. The specific name is derived from the Latin word "*prominens*", prominent, alluding to the projecting angulation on the axial ribs.

Agathotoma sp.
Fig 10 P-Q

Remarks. Also we found a large shell that is apparently different from all those previously studied, but it could be a gerontic form of *A. candidissima*. We wait for more material in order to reach a conclusion.

CONCLUSION

The Caribbean is an area very rich in biodiversity. It is expected that more species from many groups will be described in the future. In the group that we have examined in the present work the profile of the shells, in particular the shape of the upper part of the ribs, was considered to be very important and was consistent in many samples.
For comparison, we show in Figure 11 how the different profile of the shells depends on the shape of the upper part of the axial ribs below the suture.
As a separation for the species mentioned in the present work we add a Dichotomous Key on the basis of the most important differences.

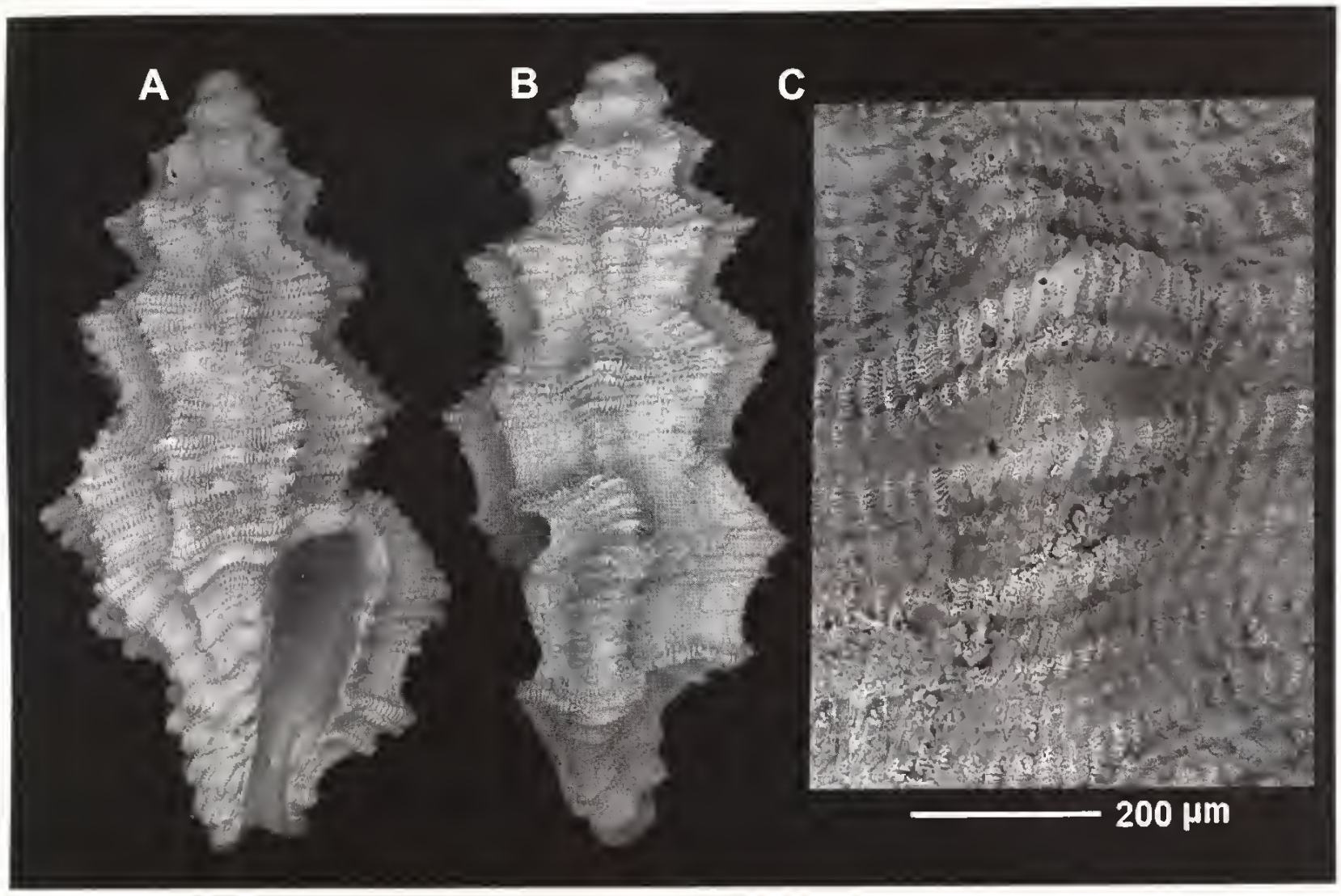

Figure 9. A-C. *Glyphoturris rugirima* (Dall, 1889). **A-B**. shell, 5.0, 4.8 mm, Rancho Luna, 10-30 m (MHNS); **C**. microsculpture.

Dichotomous key for the species of *Agathotoma* in the present work

1 -Protoconch with only 1-1.3 whorls 2
-Protoconch with at least 2 whorls 5

2 -Microsculpture of the protoconch with zigzag lines ..... *apocrypha*
-Microsculpture of the protoconch with tubercles 3

3 -Protoconch with cylindrical profile ..... *kirshi*
-Protoconch with rounded dome profile 4

4 -Protoconch with dense microsculpture of tubercles ..... *ecthymata*
-Protoconch with microsculpture of tubercles in lines ..... *eduardoi*

5 -Axial ribs with pronounced angulation a short distance below suture 6
-Upper part of axial ribs rounded near suture 7

6 - The angulation is < 90° on first whorl and around 90° on the following ones ..... *prominens*
- the angulation is about 90° on first teleoconch whorl and > 90° on the following ..... *asthenika*

7 - Axial ribs elevated subsuturally but not surpassing level of suture; the profile of the ribs is vertical ..... *candidissima*
- Upper curvature of axial ribs frequently surpassing level of suture; the profile of the ribs is inclined ..... *castellata*

Table 1

	protoconch whorls	protoconch microsculpture	protoconch diameter in µm	upper part of ribs	height/width ratio
A. candidissima	2-2.3	smooth+axial	about 400	rounded	2.6
A. ecthymata	1-1.3	dense tubercles	350-370	lower angulation	2.2
A. apocrypha	1-1.3	zigzag lines	400-430	rounded	2.6
A. castellata	2-2.3	smooth+axial	about 500	rounded high	2.3
A. kirshi	1-1.3	aligned tubercles	about 480	slightly rounded	2.4-2.7
A. asthenika	2-2.3	smooth+axial	about 410	lower angulation	2.8
A. eduardoi	1-1.3	aligned tubercles	380-400	rounded	2.6
A. prominens	2-2.3	smooth+axial	about 510	sharp angulation	2.1

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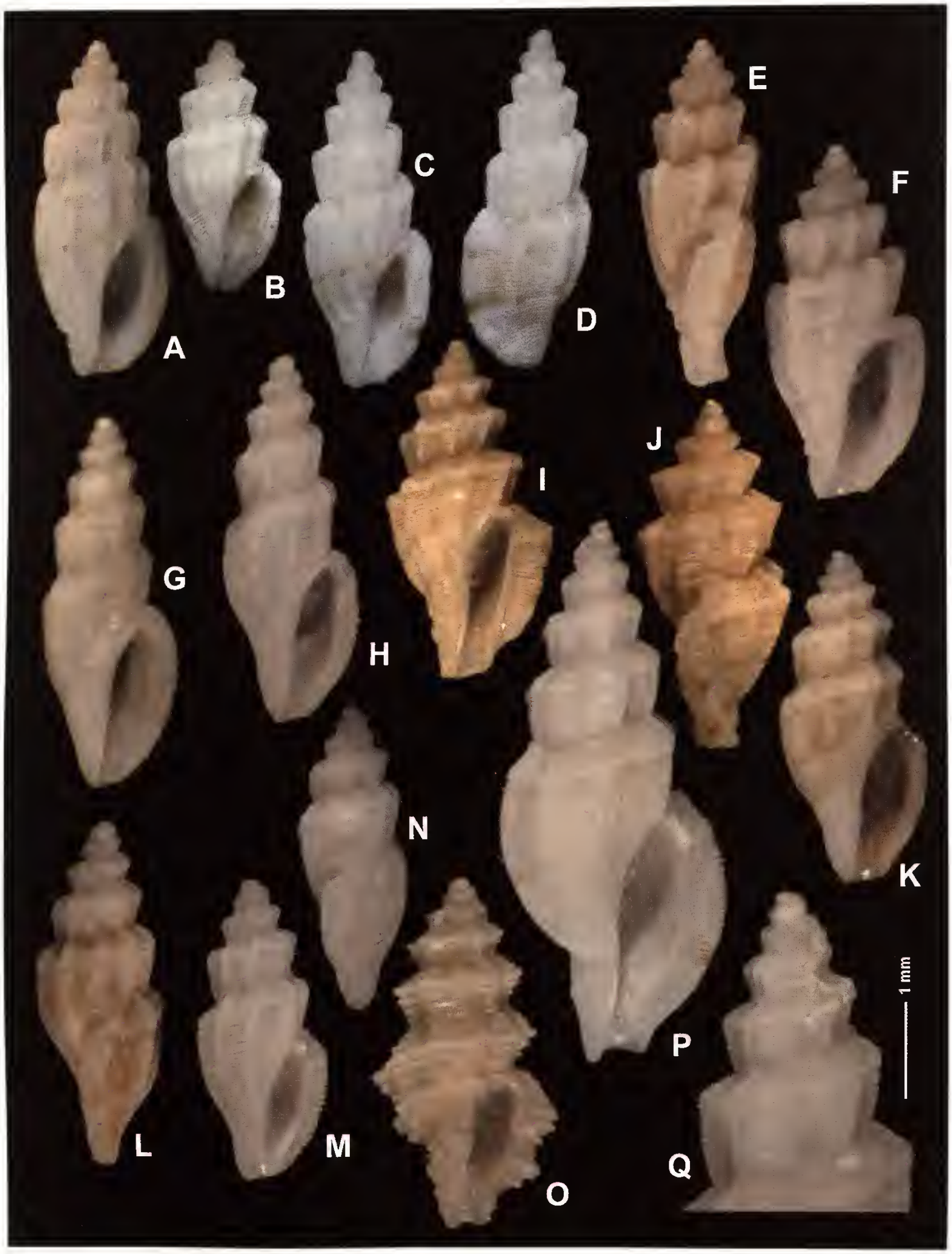
Figure 10. A-Q. Colour figures of *Agathotoma*. **A**. *Agathotoma candidissima* (C. B. Adams, 1845) 4.7 mm, Faro de los Colorados, Cuba (MHNS). **B-D**. *Agathotoma ecthymata* García, 2008; **B**. 3.7 mm, Rancho Luna (MHNS); **C-D**. 5.1 mm, Faro de los Colorados (MHNS). **E-F**. *Agathotoma castellata* (E.A. Smith, 1888), shells, 4.0, 3.9 mm (MHNS) (both represented in Figs. 4B-C). **G**. *Agathotoma asthenika* spec. nov., holotype, 3.9 mm (MNCN) (figured in Fig. 6A). **H**. *Agathotoma eduardoi* spec. nov., holotype, 4.2 mm (MNCN) (figured in Fig. 7A). **I-J**. *Agathotoma prominens* spec. nov.; **I**. holotype, 4.1 mm (MNCN); **J**. paratype, 4.3 mm (MNHN) (both figured in Fig. 8A-B). **K-L**. *Agathotoma asthenika* spec. nov., 3.4 mm, María la Gorda (MHNS) (shell figured in Fig. 6B). **M-N**. *Agathotoma eduardoi* spec. nov.; **M**. paratype, 3.3 mm (MHNS); **N**. paratype, 3.7 mm (MNHN) (both have been figured in Figs. 7B-C). **O**. *Glyphoturris rugirima* (Dall, 1889), 5 mm, Rancho Luna, 10-30 m (MHNS); **P-Q**. *Agathotoma* sp. 8.4 mm, Rancho Luna, 10-20 m (MH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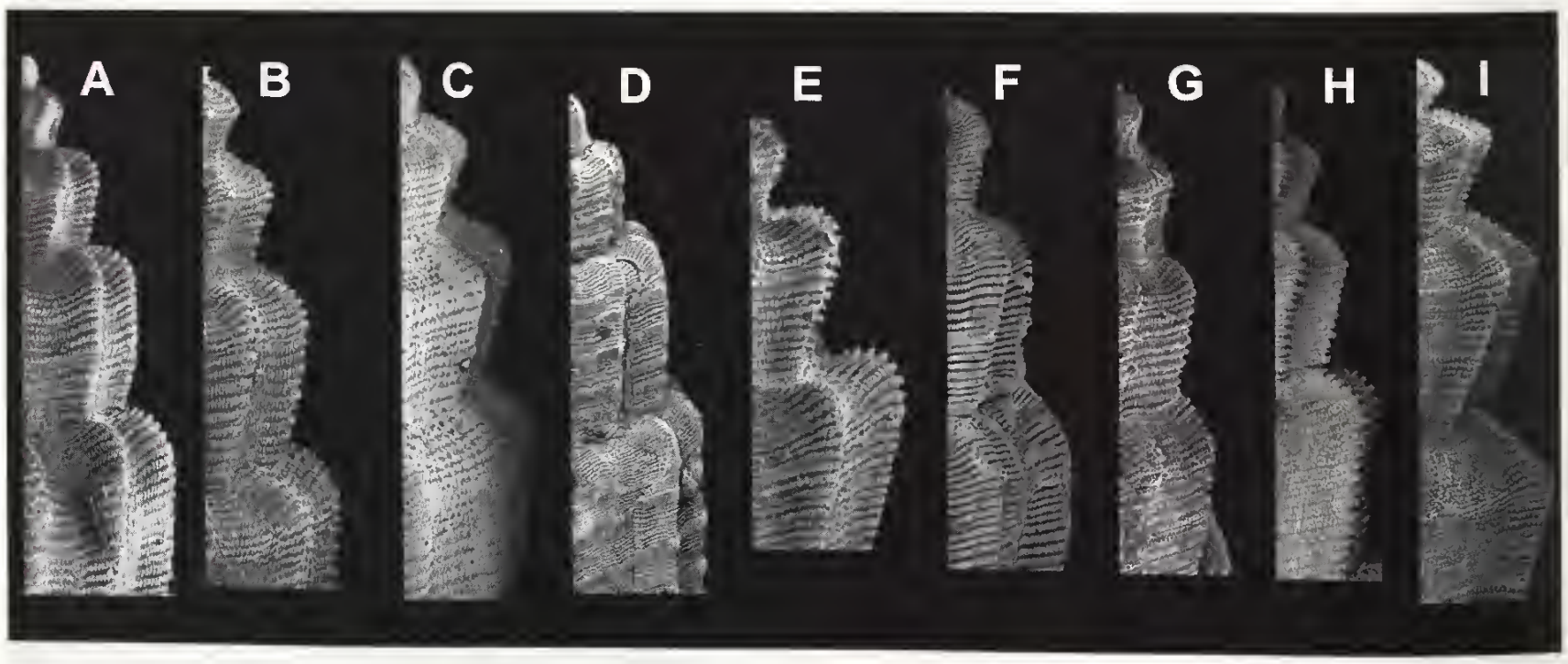

Figure 11. A-I. Comparative profile of the different species. **A-B**. *Agathotoma candidissima* (C. B. Adams, 1845); **C**. *Agathotoma ecthymata* (García, 2008); **D**. *Agathotoma apocrypha* (García, 2008); **E**. *Agathotoma castellata* (E.A. Smith, 1888); **F**. *Agathotoma kirshi* spec. nov.; **G**. *Agathotoma asthenika* spec. nov.; **H**. *Agathotoma eduardoi* spec. nov.; **I**. *Agathotoma prominens* spec. nov.

Some new information on *Calliotropis ottoi* (Philippi, 1844) (Vetigastropoda: Seguenzioidea: Calliotropidae)

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KEYWORDS. Vetigastropoda, Calliotropidae, *Calliotropis ottoi*, synonymy, new data.

ABSTRACT. Some specimens of the deep water species *Calliotropis ottoi* (Philippi, 1844) collected in Hatton Bank were studied. The shell, operculum, radula and soft parts are illustrated. The synonymy of this species with other taxa from the Atlantic is discussed.

RESUMEN. Se estudian algunos ejemplares de la especie de aguas profundas *Calliotropis ottoi* (Philippi, 1844) recolectadas en el Banco Hatton. Se muestra concha, opérculo, rádula y partes blandas. Se discute la sinonimia de esta especie con otros taxones del Atlántico.

INTRODUCTION

Calliotropis ottoi (Philippi, 1844) is a species from the Atlantic deep water, but there is a record of Martens & Thiele (1904) referring this species (and presenting the radula) from the Indian Ocean.

Hickman & McLean (1990) gave information on the soft parts, operculum and radula on the basis of the study of the American populations.

Vilvens & Swinnen (2008: figs. 29-33) made a revision of the genus *Calliotropis* from central eastern Atlantic, showing the original figures of *Calliotropis ottoi* (Philippi, 1844) from the original description and from Martens & Thiele (1904) as well as a shell from Iceland. Colman & Tyler (1988) gave information on the reprodution of this species.

Some specimens of *Calliotropis ottoi* (Philippi, 1844) were collected by rock dredge by the Spanish Oceanographic Institute Ecovul/Arpa 2007 Survey on board R/V Vizconde de Eza on Hatton Bank area (NE Atlantic) at 59°17N, 17°33W in 962 meters.

Some additional information on the morphology of this species is given in the present work.

SYSTEMATICS

Remarks

The genus *Calliotropis* Seguenza, 1803 has been placed in several subfamilies as Margaritinae, Angariinae, Monodontinae, Calliostomatinae and Solariellinae. According to Hickman & McLean (1990) it should be placed in Eucyclinae Koken, 1897, in the tribe Calliotropini Hickman & McLean, 1990. Following Bouchet & Rocroi (2005) and Vilvens (2007) this genus should be placed in the family Chilodontidae Wenz, 1938, in the subfamily Calliotropinae Hickman & McLean, 1990. Williams et al (2008), based on DNA sequences placed Calliotropidae Hickman & McLean 1990 in Seguenzioidea Verrill, 1884.

Genus *Calliotropis* Seguenza, 1903

Type species by original designation: *Trochus ottoi* Philippi, 1844, Pliocene, Pleistocene, Italy.

Calliotropis ottoi (Philippi, 1844)
Figs 1-13

Trochus ottoi Philippi, 1844: 227, pl. 28, fig. 9.

Description. *Shell* (Figs 1-4): Vilvens & Swinnen (2008) commented in the remarks the most important differential characters with other species.
Soft parts (Figs 6-10): Foot elongate, sole very rough. The cephalic lappets are relativelly small and simple. The cephalic tentacles are large and elongate with an irregular ciliate surface. The cephalic membranes are of medium size and with a continuous border. Buccal margin with lateral extensions, mouth small. The neck lobes are of medium size and very digitate. The tip of the snout are amply expanded laterally. The epipodial tentacles are numerous: Two in medium position and three other ones of different size located near of the operculum insertion. Between the tentacles and at the base of some of them sensorial organes tuberculiformis, remind small tentacles. Propodium with lateral extensions. Eyes black, pedunculate.
Operculum (Fig. 5): yellowish, transparent, with short growing edge.
Radula (Figs 11-13): The rachidian tooth has a plate from which a sharp-pointed curved part appears on the upper area. The rachidian tooth (Fig. 12R) is slightly smaller; then the lateral teeth (Fig. 12L) are three, also curved on their upper part, where some small cusps can be seen near the sharp-pointed part; they are not so large as those shown by Hickman & McLean (1990: fig 47). The marginal teeth (Fig. 12M) are numerous and similar, narrow, elongate and curved at their upper part. The existence of lateromarginal plate is confirmed but difficult to be seen.

Remarks. Figures of this species has been published by Philippi (1844) and by Vilvens & Swinnen (2008) where the figures of Martens & Thiele (1904) are also shown.

Discussion. A problem not yet resolved is the synonymy of this species:
Warén (1991) mentioned with doubts that *Margarita regalis* Verrill & Smith, 1880 could be the same species. He also presented *Solariella infundibulum* Odhner, 1912 as a synonym.
About the identification of the species we have studied, if we follow the key given by Vilvens & Swinnen (2008) we could have doubts between *Calliotropis ottoi* and *C. mogadorensis* (see Locard, 1898). Some characters, as the existence of a spiral cord into the umbilicus which has been mentioned for this last species is not sure and seems to be a variable character, as well as the first row of nodules in the subsutural area, variable in our own material. The most definitive decision was based in the origin of the material, very far from Morocco and close to the references from North Europa. It is possible that *Calliotropis mogadorensis* (Locard, 1898) could be another synonym of *C. ottoi*.
Hickman & McLean (1990: 84, figs D-E) figured the soft parts of *Calliotropis* species, showing the existence of a short number of epipodial tentacles at each side: Four in *Calliotropis carlotta* (Dall, 1902) and three in *C. regalis* (Verrill & Smith, 1880). Both are very different from the species here studied in the number and position of the epipodial tentacles. In spite of that, the position of the soft parts was examined in retracted animals, we can see in our material up to eight epipodial tentacles at each side. This seems to mean that this character is very variable into the genus. Another question is that *C. regalis* was also considered a synonym of the species here studied.

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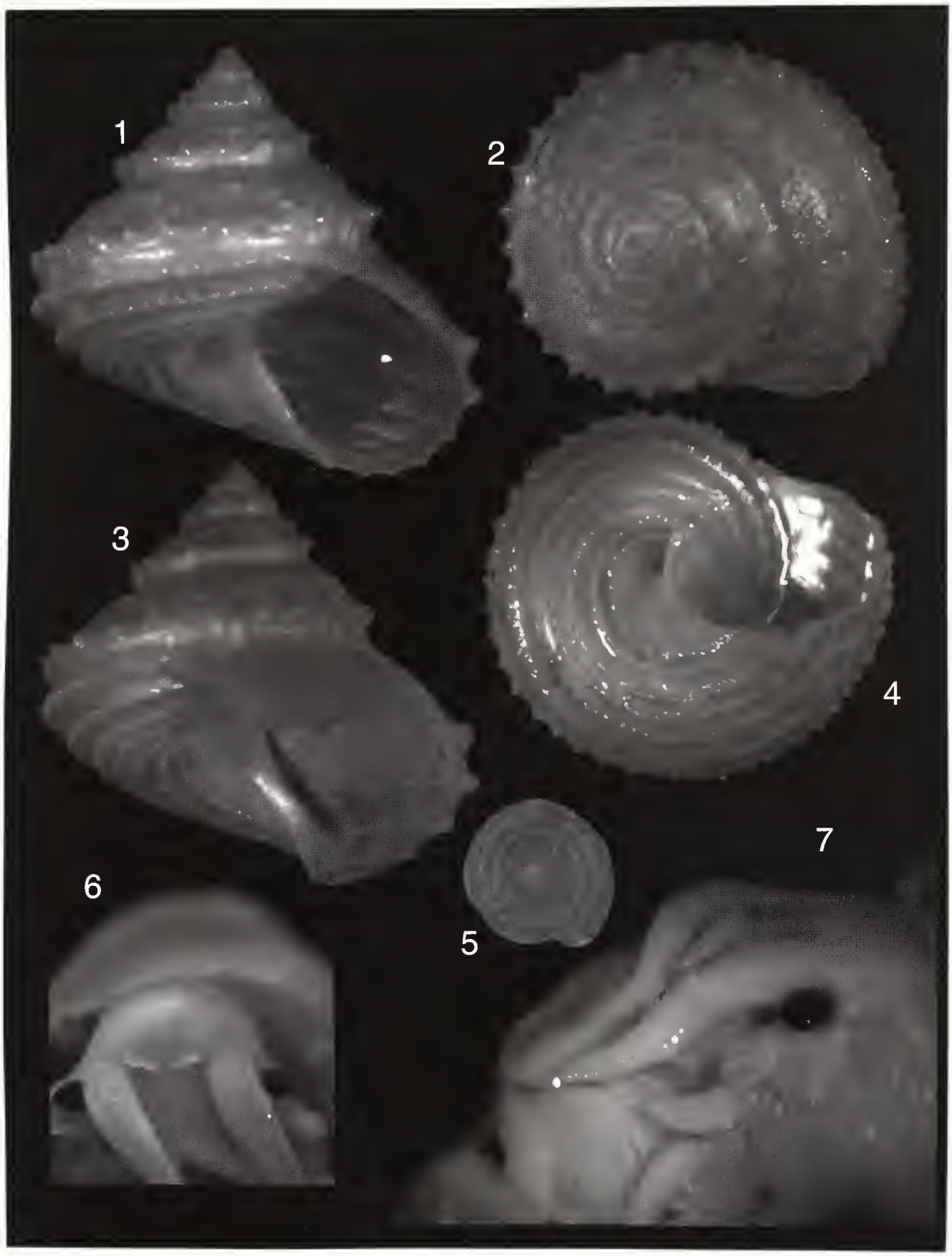
Figures 1-7. *Calliotropis ottoi* (Philippi, 1844). **1-4.** shell, 14.4 height x 16.5 mm diameter, Hatton Bank, 59°17N/17°33W; **5.** operculum; **6-7.** soft parts.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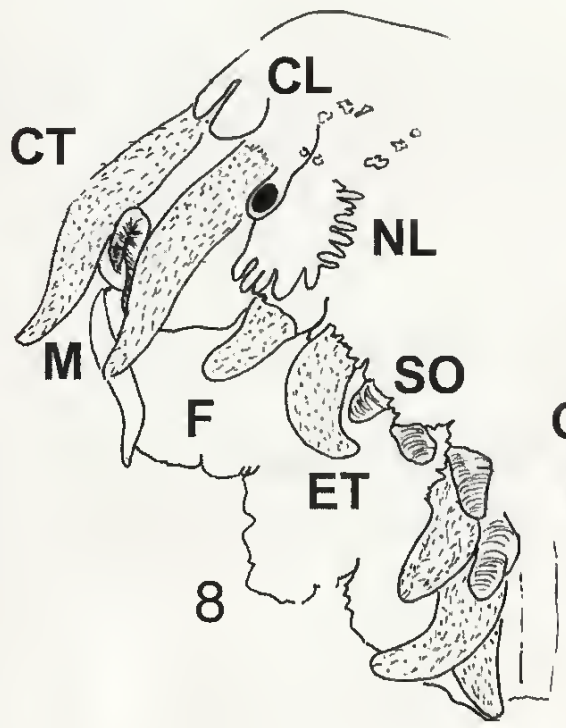
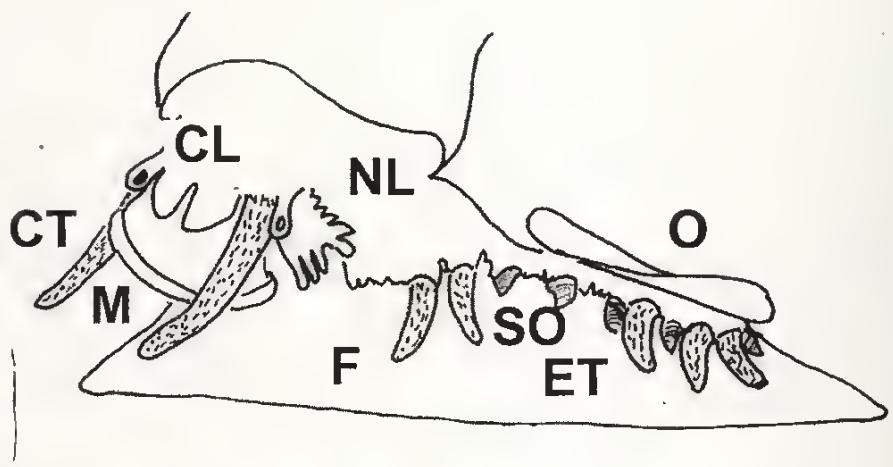
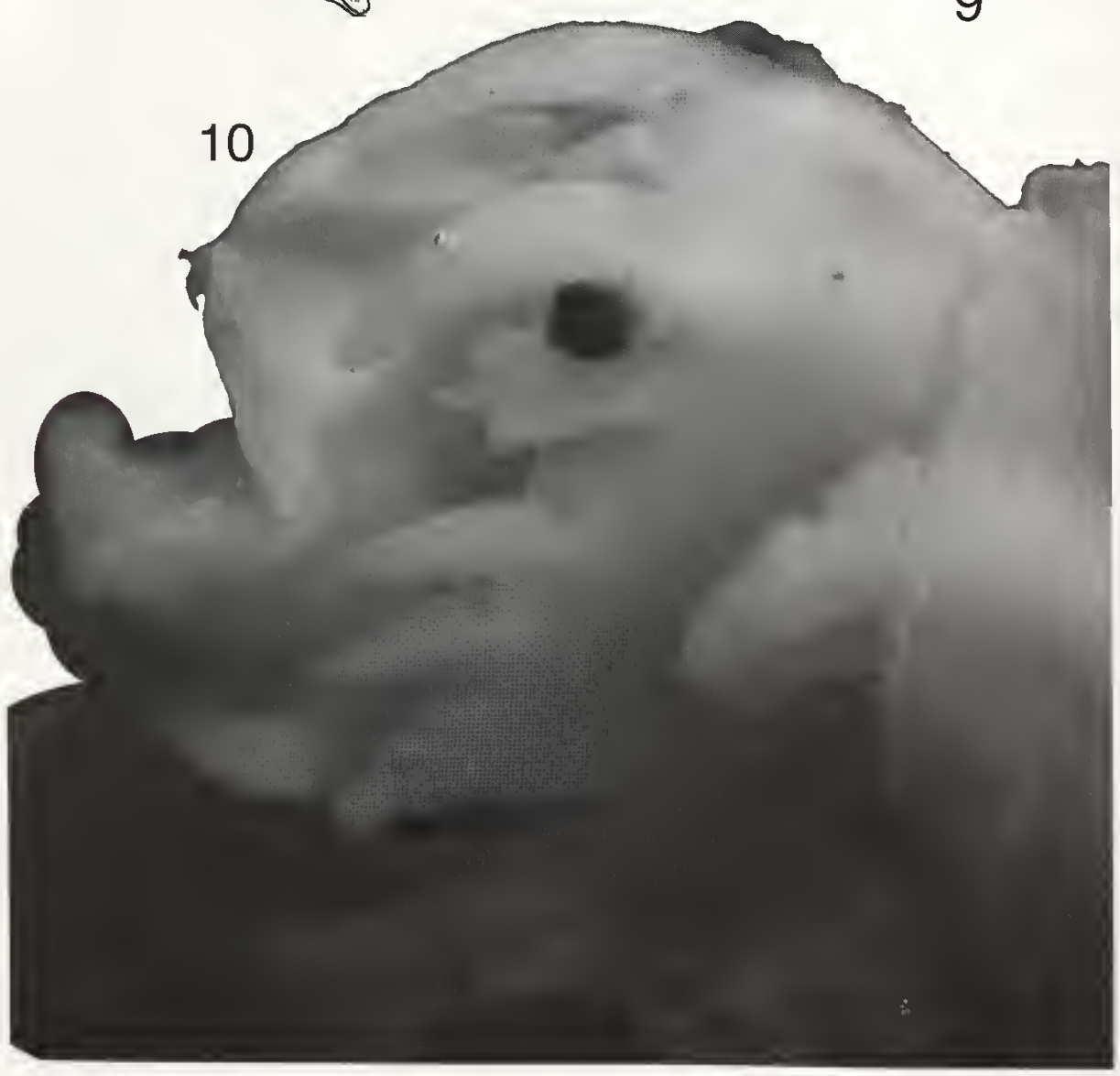
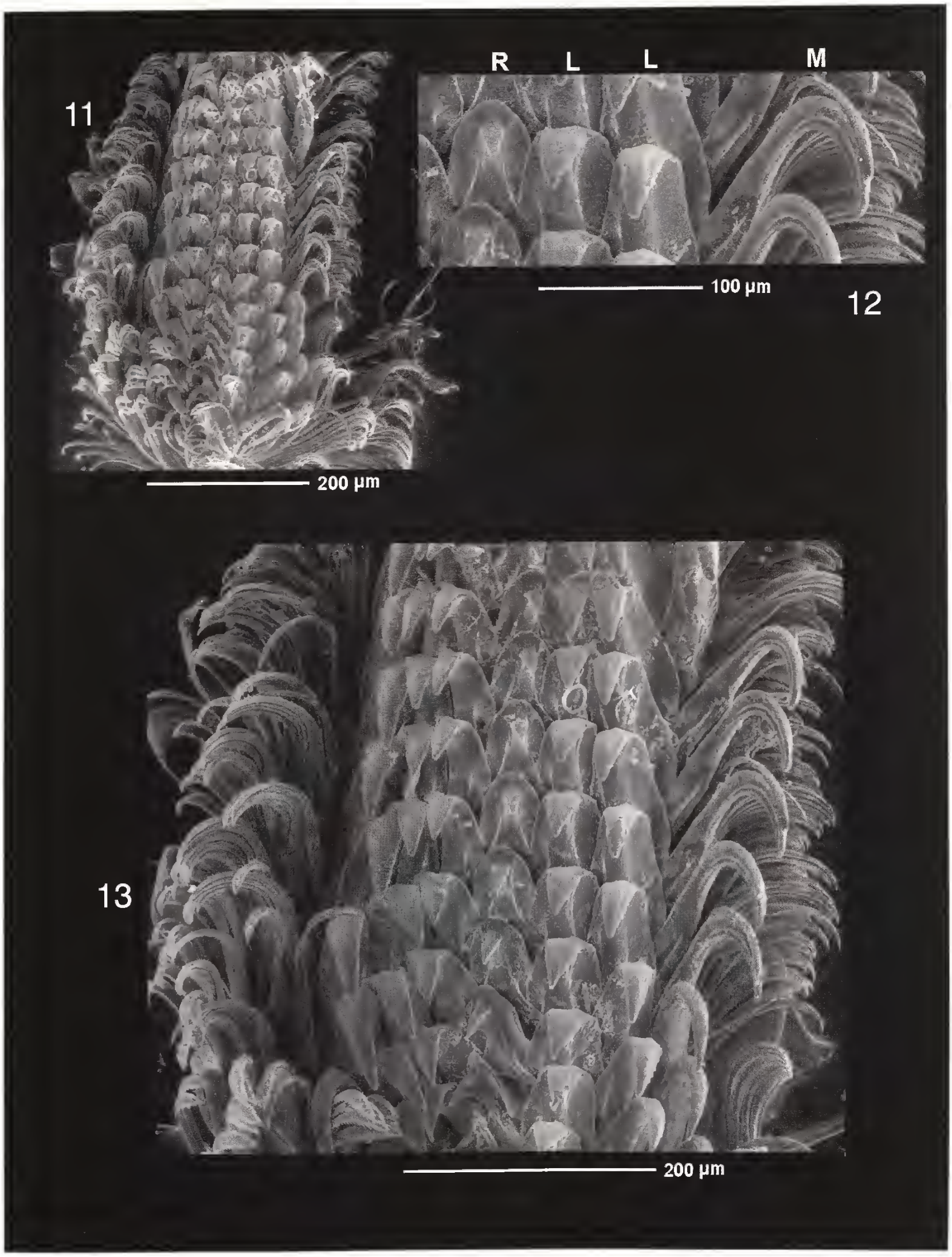






Figures 8-10

Calliotropis ottoi (Philippi, 1844). Several positions of the soft parts (preserved in alcohol). CT: cephalic tentacles; F: foot; M: mouth; NL: neck lobes; O: operculum; ET: Epipodial tentacles; SO: sensorial organes.



Figures 11-13

Calliotropis ottoi (Philippi, 1844). Radula. **11.** general view; **12.** details under magnification, showing details of the different teeth: R: rachidian tooth; L: lateral teeth; M: marginal teeth; **13.** general view under magnification.

A review of the *Marginella bicatenata* Sowerby, 1914 complex (Gastropoda: Marginellidae) with the description of a new southeast African *Marginella* species

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KEYWORDS. Marginellidae, South Africa, *Marginella bicatenata*, *M. tomlini*, *M. lemaitrei*, *M. seccombei*, species complexes, new species.

ABSTRACT. The taxa *Marginella bicatenata*, Sowerby, 1914, *M. tomlini* Shackleford, 1916 and *M. lemaitrei* Liltved & Millard, 1994, all rare deep-water South African marginellids from off the southern Cape to KwaZulu-Natal, are revised from their type material and additional lots from both public and private collections. *M. tomlini* is proposed to be a junior synonym of *M. bicatenata*, whereas *M. lemaitrei* is considered to be a sibling species. *Marginella seccombei* n. sp., a benthic species from KwaZulu-Natal often confused with *M. bicatenata* on account of its superficially similar shell pattern, is described.

INTRODUCTION

In 1914, George Brettingham Sowerby (III) described a new species of *Marginella* from a then unique shell, lacking data, which had been discovered in the collection of a Mr. M. Denans. Since Denans had collected extensively in Senegal, Sowerby erroneously assumed the type locality to be Gorée. The otherwise plain whitish shell was named *Marginella bicatenata* on account of its double row of dark spots, one at mid-body and the other at the shoulder. Two years later Lewis J. Shackleford, without reference to Sowerby's taxon, described *Marginella tomlini* from a shell with a similar pattern, only this time its provenance was known with accuracy to be off Cape St. Blaize, on the southern Cape of South Africa. This shell was dredged from 105 fathoms (equivalent to 192 m) indicating a deep water habitat on the Agulhas Bank. Since that time, and especially in recent years with increased sampling of South African benthic environments down to several hundred metres and more, further specimens of shells resembling the type specimens of both taxa have come to light and have found their way into both private and public collections. There has also been relatively recent taxonomic activity in this small complex of similar shells, with the description of *Marginella lemaitrei* Liltved & Millard, 1994. Despite the continuing scarcity of specimens available for study sufficient material now exists to make a preliminary review of the complex.

M. bicatenata ranges from Africa's southern Cape, northeast to central KwaZulu Natal, with the shells of this species exhibiting morphologic differences at each end of the geographic range of distribution. These differences are exemplified by the type specimens of *M.bicatenata* and *M. tomlini*. A new deep water species from Natal, bearing a superficially similar pattern of a double row of markings at the shoulder and mid-body, does not however appear to be directly related to *M. bicatenata*. It is described herein as *M. seccombei* n. sp.

Materials and Methods

All specimens from private collections and all of the material of the new species described herein were obtained via suppliers who sourced material from South African commercial fishing vessels as dead dredged empty shells. Curators of national museums in the United Kingdom and South Africa permitted the use of images and data of their examples of the species under study. Since live animals are as yet unknown, the species were treated conchologically. The author used a Nikon D300 SLR, a 60mm AF Micro Nikkor 1:2.8D lens and ring flash for images of *M. bicatenata* and *M. seccombei* n. sp. taken by the author. Images are shown at the same relative scale.

Abbreviations

NMW: Amgueddfu Cymru (National Museum, Wales), Cardiff.
NM: KwaZulu (Natal Museum), Pietermaritzburg.
SAM: Iziko (South African Museum), Cape Town.
AWC: Andrew Wakefield Collection, UK.
TMC: Tony McCleery Collection, UK
ad.: adult
juv.: juvenile
sh.: dead collected shell
n. sp.: new species

SYSTEMATICS

Family **MARGINELLIDAE** Fleming, 1828
Subfamily **MARGINELLINAE** Fleming, 1828
Genus ***Marginella*** Lamarck, 1799

Type species: *Voluta glabella* Linnaeus, 1758, by monotypy.

Marginella bicatenata G.B. Sowerby (III), 1914
Figs 1-21

Marginella bicatenata Sowerby (III), 1914: 147, pl. 19, fig. 7.
Marginella tomlini Shackleford, 1916: 193, text figs 3, 4.

Type material. *Marginella bicatenata*,1 ad sh., holotype, preserved dry, 13 x 7 mm, Gorée, coll. Tomlin (ex. Coll Denans), NMW.1955.158.01434, (Figs 1, 2).
Marginella tomlini, 1 ad. sh., holotype, preserved dry, 18 x 10 mm, off Cape St. Blaize in 105 fms, SAM A3704 (Figs 13-15).

Other material examined. 6 ad and 1 juv. sh, from KwaZulu-Natal, preserved dry: 12.8 x 6.9 mm, 29.825° S 31.2383°E, NM ref. no. D3819 (Figs 3,4); 13.9 x 7.5 mm, 30.0132° S, 31.06°E, NM ref. no. D1159 (Figs 5,6); 15.7 x 8.5 mm, 30.0067° S 31.05°E, NM ref no. D1094 (Figs 7,8); 13.5x6.6 mm, juv., NM ref. no. E8656 (Figs 9, 10); 11.7 x 6.8 mm, 30.0182° S 31.0533°E, NM ref. no. D800 (Figs 11, 12); 14.6 x 8.8 & 12.8 x 7.4 mm, 30.1067° S 31.0133°E, NM ref. no. D1946.
2 ad sh., from the southern Cape region, preserved dry: 17.8 x 9.95 mm, Agulhas Bank, dredged, depth unrecorded, AWC; 16.2 x 9.33 mm, southern Agulhas Bank at 100m, AWC (Figs 16, 17).

Type Locality. Gorée, Senegal (in error)

Descriptive notes. Shell thin, smooth, length 11.5-18 mm, W:L ratio 54-60% (mean 56%), strongly biconic to elongated biconic. Spire elevated, of 4.5 whorls including paucispiral protoconch, stepped (mainly between penultimate and last adult whorl) to straight sided. Shoulder smoothly rounded to slightly angulated, shell tapering to narrow, slightly truncated anterior end. Creamy white, pale straw to pale grey body whorl, with two spiral rows of blurred charcoal grey spots: anterior row of 6-8 spots emerges from aperture immediately posterior to 4th plication, ending at anterior 1/6th of lip; posterior row of 7-10 (on body whorl) spots at shoulder level. Posterior row continues onto spire to reach plain, glassy protoconch. Suture not impressed. Lip, plications, base of columella white. Aperture approximately 1.5 x as wide as labial varix. Lip smooth, straight to gently convex, thickened externally as a single moderately strong varix with a smooth rolled edge. Varix groove present externally. Siphonal notch absent, posterior notch weak, lip thins slightly in posterior 1/6th before inserting to body whorl at shoulder at level of posterior row of spots, or just anterior to it. Lip continues round anterior end, thinning out completely to join base of columella at end of first plication. Columella with 4 moderately strong, thin, single plications, gradually increasing in separation from 1st to 4th. First two oblique, 3rd and 4th becoming more horizontal. Plications fill over ½ but less than 2/3 of aperture. Columella slightly concave in region of plications. Parietal surface smooth, weakly convex to straight. Anterior and posterior callus absent. Animal unknown.

Distribution. Off central KwaZulu-Natal to Cape St. Blaize, southern Cape, South Africa, depth range 100-200 metres.

Remarks. The species is listed by Tomlin (1917: 253) who records the holotype of *M. bicatenata* as being present in the Tomlin collection. The Melvill-Tomlin Collection was received by Amgueddfu Cymru (NMW) in 1955, and enquiries have confirmed that the holotype is present in the collection. It is biconic in profile (Figs 1, 2) and from the ventral view has three large spots at the shoulder and four at mid-body. It clearly is the shell depicted and described by Sowerby. Similarly robust, relatively small, dirty-white shells with charcoal coloured spots and with a variety of strong morphologic features such as stepped spires, and strongly angulated shoulders are found at the north-eastern end of the range, off KwaZulu-Natal (see the specimens from the NM in Figs 3-12). As the holotype exhibits these characters it is much more likely to have originated from Natal than from the southern Cape, and the original type locality has always been erroneous – this is emphatically not a West African shell.
Millard (1981, fig. Da, p. 6, 7) figured a specimen present in the SAM (ref. A3704), citing it as the type of *M. bicatenata*. As noted above, the holotype of *M. bicatenata* is in the NMW. The specimen to which Millard was referring is in fact the holotype of *M. tomlini* Shackleford, 1916 (Figs 13-15). The original description of it featured a quality photograph of the holotype - one of the earliest original descriptions to do so - and its identification as the holotype of *M. tomlini* is beyond any doubt. Shackleford recorded the type locality as off Cape St. Blaize, southern Cape, South Africa, 'N. by E. ½ E., distant 68 miles – 105 fathoms (*sic*)'. *M. tomlini* is considered to be a junior synonym of *M. bicatenata*, and represents the form found at the southern end of the range. These shells are larger and thinner walled than their northern counterparts, and they also inhabit relatively shallower waters in the south. This trend is observed in most other species of South African marginellidae with a similar distribution pattern. This progressive morphological change has been attributed to many factors, one being the availability of food (the cooler waters of the Cape are rich in nutrients compared to the warmer waters of KwaZulu-Natal).
One of the NM specimens (Figs 9, 10) of *M. bicatenata* is in exceptional condition and is very well marked, and even shows extra fine spiral lines of spots

between the two main ones. Most specimens of *M. bicatenata* are dead collected and worn – it may be that fresh specimens have traces of extra fine spiral lines in the surface layers of the shell. These markings are not as defined or as bold as those found in *M. lemaitrei*.

M. bicatenata is very distinctive and is unlikely to be confused with anything else. *M. nevillana* Kilburn, 1977 (7.6 x 4.5 mm) as yet only known from its holotype from the eastern Cape, is much smaller than *M. bicatenata*, has eight rows of large charcoal grey spots on a white background, a much thicker shell and because of its denticulate lip is better placed in the genus *Glabella* Swainson, 1840 (in the *G. obtusa* Sowerby, 1846 complex).

Marginella lemaitrei Liltved & Millard, 1994
Figs 22-26

Marginella lemaitrei Liltved & Millard, 1994: 3, 4, fig 1.

Type material. 1 ad. sh., holotype, 18.4 x 10.0 mm, *ex. pisce*, trawled approx 100m, Cape St. Blaize, southern Cape, South Africa, SAM A37572 (Figs 22-24) ; 1 ad sh., paratype, 17.1 x 8.9 mm, *ex. pisce*, trawled approx 100m, Cape St. Blaize, southern Cape, South Africa, NM E7213/T184.

Other material examined. 1 ad. sh., unmeasured, no data, photographed by Markus Lussi (Figs 25, 26). Specimen figured on p. 6, 7, fig. Db, in Millard, 1981 (21 x 11mm), '*ex. pisce*' off the Cape. Specimen image by Brian Hayes (2011).

Type locality. Cape St Blaize, southern Cape, South Africa.

Distribution. Restricted to the Agulhas Bank off the southern Cape, South Africa.

Descriptive notes. Shell length 17.1 – 21.0 mm, W:L ratio 52-54% (mean 53%), straw coloured to greyish, thin, smooth, satin, elongate-biconic, of 4.5 whorls including paucispiral protoconch, weakly shouldered, tapering to a narrow anterior end. Suture not impressed. Lip with smooth, evenly thickened, white margin, smooth internally, with external varix groove. Plications strong, evenly spaced plications filling over half of aperture. First two oblique, third and fourth straighter. Columella slightly concave. Aperture narrowing posteriorly, otherwise of even width. 4-8 spiral rows of fine grey spots and streaks on body whorl. Holotype has 8 rows; 4 anteriorly, 2 at mid-body, 2 on the spire. Paratype has 4 rows with less frequent, more blurred markings. Axial pattern of pale grey narrow to wide flammules on body whorl.

Remarks. According to Liltved and Millard (1994: 4), *M. lemaitrei* occurs sympatrically with *M. bicatenata* ('*M. tomlini* form') off the southern Cape. In fact the types of *M. lemaitrei* and the holotype of *M. tomlini* are syntopic. The types of M. lemaitrei were taken from the stomach contents of the fish *Congiopodus torvus* Walbaum.

M. lemaitrei differs from *the 'M. tomlini* form' of *M. bicatenata* in that it is generally slightly larger, more slender (less shouldered), has multiple rows of dashes and dots rather than two, and often has an additional axial pattern of pale grey narrow to wide flammules. The slender thin shell and axial flammules are also characters seen in *Marginella diadochus* Adams & Reeve, 1848 and therefore the possibility of an ancestral link of the *M. bicatenata* group to the *M. musica* group should be considered.

Marginella seccombei n. sp.
Figs 28-39

Type material. 5 ad. sh., dredged, preserved dry, off Central KwaZulu-Natal in 150m; holotype, 12.61 x 7.46 mm, NM W8641/T2985 (Figs 27-30); paratype 1, 13.29 x 8.37 mm, NM, W8642/T2986, (Figs 31, 32); paratype 2, 12.48 x 8.28 mm, AWC (Figs 33, 34); paratype 3, 10.88 x 6.35 mm, TMC (Figs 35, 36); paratype 4, 13.75 x 8.48 mm, NMW.Z.2012.016.00001

Type locality. Off central KwaZulu-Natal, South Africa.

Other material. 1 ad. sh. unmeasured, off Durban, KwaZulu-Natal, photographed by Markus Lussi (Figs 37, 38)

Distribution. Off Central KwaZulu-Natal in 100-150 metres.

Description. Shell moderately sized (L=12.6 mm), W:L ratio 58 – 66 % (mean 61.4%), solid, biconic, of 4 ½ whorls including paucispiral protoconch, posteriorly tapering to moderately wide columella base. Pale straw coloured with two spiral bands of very short axially oriented red-brown dashes encircling body whorl. Anterior row appears darker due to dashes being closer together. Dashes regularly spaced and shaped ventrally, becoming more separated and irregular from mid-dorsum to lip. Anterior (mid-body) row of 24 closely spaced dashes emerges immediately posterior to 4th plication. Posterior row of 20 more spaced marks at shoulder on body whorl, continuing for another 2 ¼ whorls onto spire. Lip, base of columella and plications white. Shoulder rounded, spire moderately elevated, suture present, spire whorls shouldered. Posterior end of lip inserts at shoulder at level of posterior spiral band. Columella slightly concave anteriorly, parietal surface very slightly convex. Aperture widest in middle third, twice as wide as the lip, narrowing posteriorly and anteriorly to as wide as the lip. Lip evenly convex in

profile, smooth, denticles absent, external varix strong with varix groove externally. Posterior notch absent, siphonal notch weak. Four strong pilications, first two oblique, third and fourth straighter, round crested, spacing between increasing from first to fourth, ends terminate at level of lip except for first which sweeps round to join with base of columella and anterior end of lip.
Animal unknown.

Etymology. The species is named after Alan Seccombe (Cape Town), who first drew the authors attention to this species.

Remarks. The type series (Figs 27-36) displays the variability in this species. The number of short axial dashes in the two bands varies slightly, from 19 to 23 in the anterior band and from 19 to 24 in the posterior band. Whilst many shells are marked only with the two main spiral rows, others have extra rows of finer markings. Paratype 2 (Figs 33, 34) is exceptionally well marked and reveals these extra spiral lines of extremely fine dots and dashes on the body whorl, with 22 fine spiral dotted lines between the two main bands, but also several anteriorly, and posteriorly onto the spire. Paratype 1 (Figs 31,32) has these extra fine spiral lines of dashes and dots more organised so they line up in an axial pattern.

DISCUSSION

Although the colour pattern of *M. seccombei* apparently links it to the *M. bicatenata* complex, there are several characters which when studied in detail, provide us with an indication that *M. seccombei* is not closely related to it at all. Firstly, the shells of the *M. bicatenata* complex are all relatively thin and have lower W:L ratios; 54-60% (mean 56%) for *M. bicatenata* and 52-54% (mean 53 %) for *M. lemaitrei*. The W:L ratio of *M. seccombei* is much higher at 58-66 % (mean 61.4%) and is clearly a more robust, stockier shell than those of the *M. bicatenata* group. Secondly, the double row of reddish-brown axial dashes in *M. seccombei*, is fundamentally different in its genesis from the double row of smudged charcoal grey spots of the other species. This strongly suggests that *M. seccombei* has a different phyletic lineage, and that its pattern should be regarded merely as a convergent shell character with the *M. bicatenata* group. We must look elsewhere for links to its related species.
When the species in the *M. ornata* complex express spiral lined patterns, they tend to do so as bands of small axially orientated markings. This is very evident on reddish specimens of *M. ornata* Redfield, 1870 and also in *M. beltmani* Hart, 1993 and *M. peelae* Bozzetti, 1993. *M. seccombei* also shares the same general morphology of the shells in the *M. ornata* complex, with their stocky outline and convex, often stepped later spire whorls. On purely conchological grounds therefore, a relationship with the *M. ornata* complex would seem justified although the lack of external lip markings in *M. seccombei*, compared with strongly marked lips of those in the *M. ornata* complex, cannot be ignored.
Looking then to more northerly species for allies of *M. seccombei*, the pattern and morphology of two deep-water Mozambique species *M. verdascai* Hayes & Rosado, 2007 and *M. monicae* Bozzetti, 1997 appear close. *M. verdascai*, though much smaller at a length of 5.6 - 6.8 mm (in the type series), has a very fine spiral lined pattern very much like that seen in the better preserved specimens of *M. seccombei*.

Figures 1-38

1-21. *Marginella bicatenata*, G.B. Sowerby (III), 1914;
1-2. *M. bicatenata*, Holotype, 13 x 7 mm, Coll. Tomlin (NMW 1955.158.01434); **3-4.** Off Durban, Natal,12.8 x 6.9 mm, 29.825°S 31.2383°E (NM D3819); 5, 6. Off Durban, Natal, 13.9 x 7.5 mm, 30.0132°S 31.06°E (NM D1159); 7, 8. Off Durban, Natal, 15.7 x 8.5 mm, 30.0067°S 31.05°E (NM D1094); 9, 10. Off Durban, Natal, 13.5 x 6.6 mm (NM E8656); 11, 12. Off Durban, Natal, 11.7 x 6.8 mm, 30.0182°S 31.0533°E (NM, D800); 13-15. *M. tomlini*, Holotype, trawled off Cape St. Blaize, Southern Cape, South Africa in 192m, 18 x 10 mm (SAM A3704); 16, 17. Southern Agulhas Bank, Southern Cape, South Africa, 16.2 x 9.33 mm (AWC); 18-22. Series demonstrating pattern and morphologic variability, data unknown (photo Lussi).
22-26. *Marginella lemaitrei* Liltved & Millard, 1994;
22-24. Holotype, Cape St. Blaize, Southern Cape, South Africa, 18.4 x 10.0 mm (SAM, A37572); 25, 26. Data unknown (photo Lussi)
27-38. *Marginella seccombei* n.sp., off Durban, KwaZulu-Natal, dredged dead in 150m.
27-30. Holotype, 12.61 x 7.46 mm (NM, W8641/T2985); 31, 32. Paratype 1. 13.29 x 8.37 mm (NM, W8642/T2968); 33, 34. Paratype 2. 12.48 x 8.28 mm (AWC); 35, 36. Paratype 3. 10.88 x 6.35 mm (TMC); 37, 38. Data unknown (photo Lussi).

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However, it lacks the two main spiral bands of brown axial markings and it has a weakly denticulate lip. Although smaller than *M. seccombei, M. monicae* is a shell of comparable shape though it is thicker and slightly pyriform. Although mainly lacking a colour pattern, it has a faint trace of dark markings (not clear spots or axial streaks) at the shoulder and at the anterior end in the same place as the spiral rows in *M. seccombei*. It appears to be the species closest morphologically to *M. seccombei* discovered to date. *M. tuguriana* Lussi,1993, another benthic species occurring in northern Natal and possibly ranging further north into Mozambique, also has a faint anterior band, but its extremely biconic morphology, thicker shell and labial markings distinguish it clearly from *M. seccombei* n. sp.

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Dr. Igor Muratov (KwaZulu-Natal Museum) kindly provided the images of *M. bicatenata* (Figs 3-12). Linda Davis (Collections Manager, KwaZulu-Natal Museum), Liz Hoenson (Iziko, South African Museum), and Harriet Wood (Amgueddfu Cymru, National Museum of Wales) generously provided access to type material and/or information. I would like to express special thanks to Alwyn Marais (Centre for Molluscan Studies, South Africa) for the images of the holotype of *M. tomlini* (Figs 13-15), and to Markus Lussi (Durban) for his opinions on the distribution of *M. bicatenata*, for his excellent images (Figs 16-21, 25, 26, 37 and 38) and for being my referee. A final thanks to Alan Seccombe (Cape Town) for providing the author with type material of *M. seccombei*.

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Description of a new species of *Siratus* (Gastropoda: Muricidae) from Guadeloupe, Lesser Antilles

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KEYWORDS. Gastropoda, Muricidae, Lesser Antilles, Martinique, *Siratus*, new species.

ABSTRACT. *Siratus michelae* is described from six specimens dredged in about 70 m depth off Martinique, French Antilles. It is compared with *S. cailleti* (Petit, 1856) and *S. kugleri* (Clench & Pérez Farfante, 1945), both also occurring in the same area, but at greater depth.

INTRODUCTION

There are currently 27 Recent species of *Siratus* of which 24 live throughout the Western Atlantic and three in the Indo-West Pacific (Houart, 2012).

All the species are listed by Houart (2010) and most of them are illustrated by Merle, Garrigues & Pointier (2011). The Western Atlantic species were also commented and illustrated by Vokes (1965 and 1990a), while nine species from the Western Atlantic were named since 1990 by Vokes (1990b), Houart (1999 and 2000), Merle, Garrigues & Pointier (2001) and Merle & Garrigues (2008 and 2011). The most recent species was described from the Dominican Republic and Martinique.

Abbreviations

Repository

MNHN: Muséum national d'Histoire naturelle, Paris, France.
RH coll. : Collection of Roland Houart.
JC coll.: Collection of Jacques Colomb.

Terminology used to describe the spiral cords and apertural denticles morphology (after Merle, 1999 and 2001) (Figs 1-2).

P: primary cord; **s:** secondary cord; **t:** tertiary cord; **ad:** adapical (or adapertural); **ab:** abapical (or abapertural); **IP:** infrasutural primary cord (primary cord on subsutural ramp); **adis:** adapical infrasutural secondary cord (on subsutural ramp); **abis:** abapical infrasutural secondary cord (on subsutural ramp); **P1:** shoulder cord; **P2-P6:** primary cords of the convex part of the teleoconch whorl; **s1-s6:** secondary cords of the convex part of the teleoconch whorl (example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.); **ADP:** adapertural primary cord on the siphonal canal; **MP:** median primary cord on the siphonal canal.
Aperture: **ID:** Infrasutural denticle ; **D1 to D6**: Abapical denticles

SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815
Subfamily **MURICINAE** Rafinesque, 1815
Genus ***Siratus*** Jousseaume, 1880
Type species, by original designation: *Purpura Sirat* "Adanson" Jousseaume, 1880 (= *Murex senegalensis* Gmelin, 1791), Recent, Brazil.

Siratus michelae n. sp.
Figs 1-2, 3-4, 7-12

Type material. Holotype MNHN 25131
Paratypes: 4 JC coll., 1 RH coll.

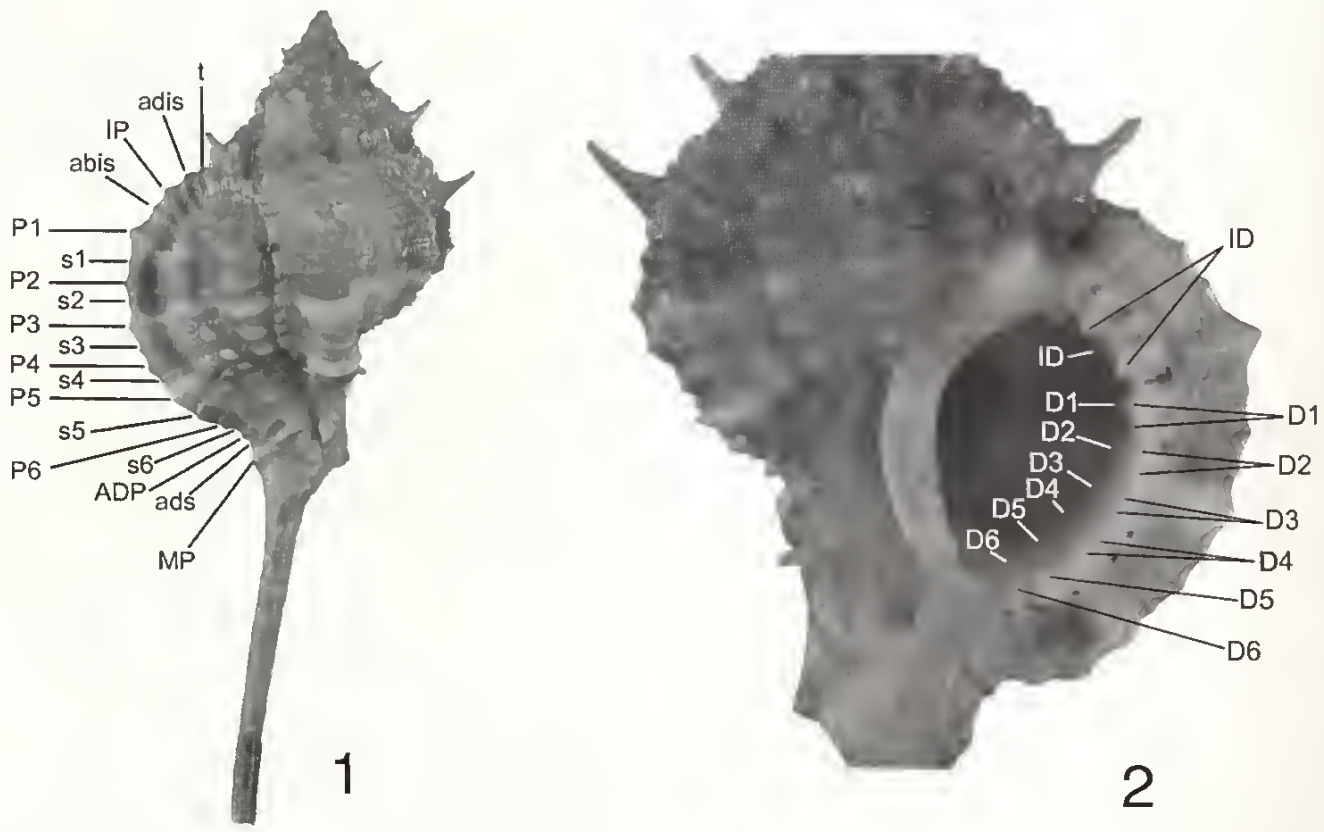
Type locality. Martinique, Atlantic coast, 70 m.

Distribution. Currently only known from the type material: Martinique, Atlantic coast, alive at 70 m.

Description. Shell small for the genus, up to 41.4 mm in height at maturity. Height/width ratio 2.1-2.2. Broadly ovate, nodose, lightly built. Subsutural ramp broad, strongly sloping, weakly concave.
Light brown or greyish-brown with lighter coloured or creamy white axial nodes. Spiral cords usually topped with fine dark brown lines. P3 and P5 almost entirely white, more obvious on axial nodes. Area between P3 and P5 lighter coloured. MP spine creamy white.

Protoconch light or dark brown. Aperture bluish-white, parietal tooth white, edge of outer lip with dark brown spots between apertural crenulations.
Spire moderately high with 1.75 protoconch whorls and 6-6.5 broadly convex, weakly shouldered, nodose whorls. Suture weakly adpressed. Protoconch small, whorls rounded with a weak, narrow, single keel abapically (Fig. 4). Maximum width 700-900 µm, height 700 µm. First whorl small, 300-350 µm width. Terminal lip shallow, delicate, opistocyrt.
Axial sculpture of teleoconch whorls consisting of high, narrow, rounded ribs and high, strong, narrow, rounded, weakly spinose varices. First whorl with 11-13 ribs, second whorl with 5-9 ribs, starting varices, third whorl with 3 low varices and 2 intervarical ribs of similar height, fourth to last whorl with 3 high, narrow, rounded varices and 3 narrow, high intervarical ribs. Spiral sculpture of high, strong, narrow, nodose, primary, secondary and tertiary cords. First whorl with P1-P3, second and third with IP, P1-P3, fourth with adis, IP, abis, P1 and P2, P3 occasionally covered by subsequent whorl, fifth whorl with adis, IP, abis, P1, s1, P2, last teleoconch whorl with t, adis, IP, abis, P1, s1, P2, s2, P3, s3, P4, s4, P5, s5, P6, s6, ADP, ads, MP. Intersection of axial ribs and varices with spiral cords forming broad, high, strong nodes. Spiral cords P1 and MP giving rise to small, acute spine.
Aperture narrow, ovate. Columellar lip narrow, with narrow, elongate folds adapically and abapically with 3-5, elongate, strong, oblique knobs, increasing in strength abapically. Rim partially erect, adherent at adapical extremity. Strong parietal tooth at adapical extremity. Anal notch deep, narrow. Outer lip erect, weakly crenulated, with weak or strong, low, narrow denticles within: ID, D1-D6. ID, D1-D4 split at inner edge of outer apertural lip (Fig. 2). Adapical and abapical denticles higher and stronger, D3 and D4 low. Siphonal canal long, 49-50% of total shell height, narrow, straight, strongly dorsally bent, narrowly open.
Operculum brown, ovate, with subapical nucleus and 9 or 10 broad, concentric ridges. Attached surface with about 6 or 7 growth lines and broad callused rim.

Etymology. The new species is named for Michèle Colomb, the wife of the second author.

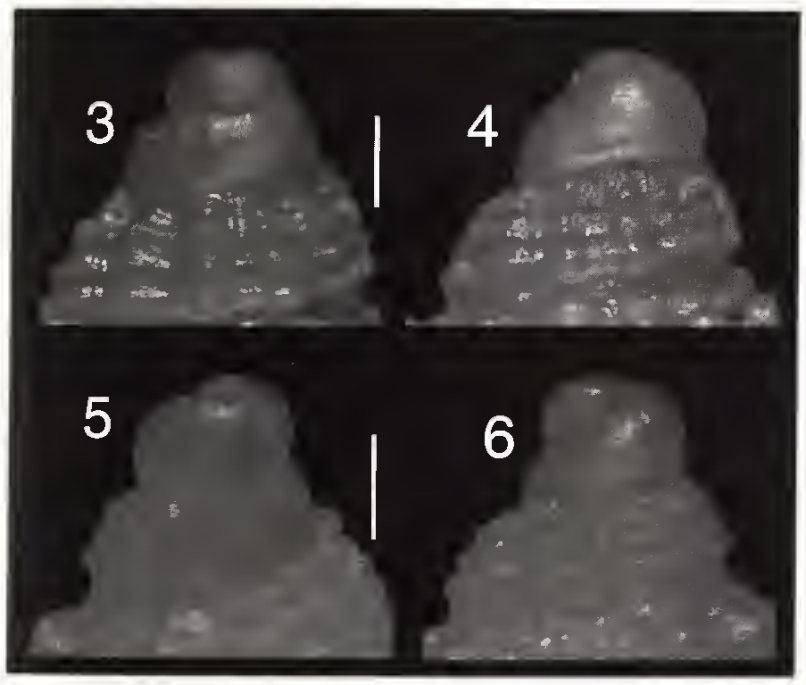


Figs 1-2. *Siratus michelae* n. sp. spiral cords and apertural denticles morphology (paratype RH coll.).

Remarks. *Siratus michelae* n. sp. can be compared with two species only, that also occur off Martinique, although at depth of about 150-200 m.
Siratus cailleti (Petit, 1856) (Figs 5-6, 13-16) differs in having a larger shell with a larger and broader protoconch (Figs 5-6), with a width of 1000 µm and a height of 800-900 µm,.lacking the fine abapical keel, in having only two, broader and higher intervarical ribs on penultimate and last teleoconch whorls, and in having a relatively broader siphonal canal.
Siratus kugleri (Clench & Pérez Farfante, 1945) (Figs 17-22) most of the time also has a shell with three intervarical ribs on four or three abapical teleoconch whorls, but the protoconch is larger and also lacks the abapical keel, the shell is relatively larger with a much broader last teleoconch whorl, a broader aperture and a relatively broader siphonal canal.
Merle et al (2011, pl. 24, fig. 12) illustrated a shell in MNHN as a syntype of *M. similis* Sowerby, 1841. *Murex similis* is an earlier name for *S. kugleri* but a junior homonym of *M. similis* Schröter, 1805, thus invalid. *Siratus kugleri* was named as a replacement name for *M. similis* Sowerby. The specimen from MNHN was brought to the museum by Sowerby in

1879 and is most probably the shell that he illustrated himself (Sowerby, 1879: pl. 3, figs 22 & 23 only), but not a syntype. Apparently *M. similis* Sowerby was described from a single specimen. The shell originally figured by Sowerby (1841: pl. 189, fig. 70) from the Jane Saul collection is in the University Museum of Cambridge and was catalogued as the holotype by Bishop & Way (1976: 43) (Figs 17-18).

The shell morphology and the colour in *S. michelae* n. sp. differentiate it definitively from any other Western Atlantic *Siratus* species.



Figures 3-6. Protoconchs (scale bars: 500 µm)

3-4. *Siratus michelae* n. sp., paratype RH coll.; **5-6.** *Siratus cailleti* (Petit, 1856), Martinique, 250 m, JC coll. (specimen illustrated Figs 15-16).

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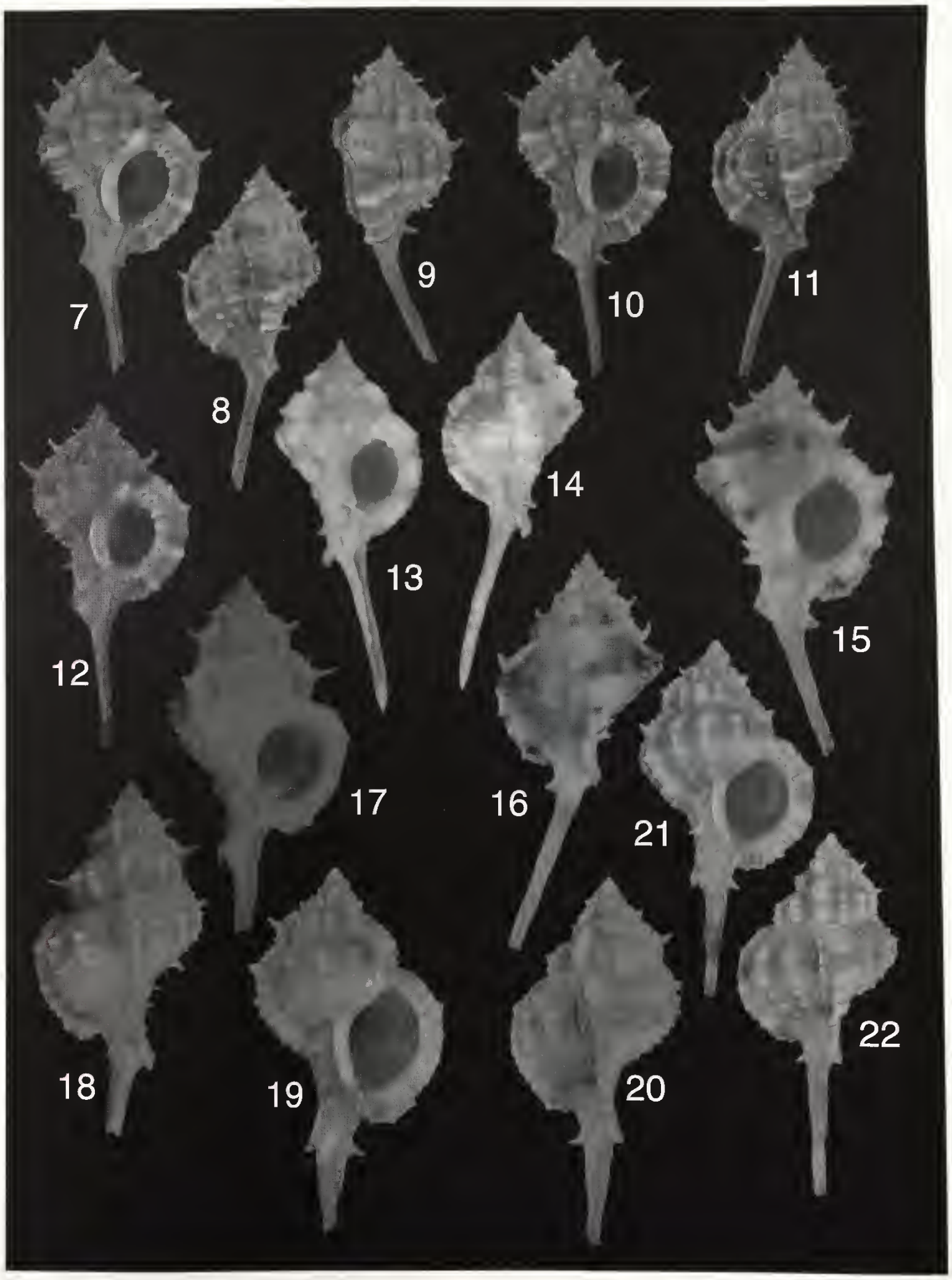

Figures 7-22

7-12. *Siratus michelae* n. sp., Martinique, Atlantic coast, 70 m. **7-9.** Holotype MNHN 25131, 39 mm; **10-11.** Paratype JC coll, 41.4 mm; **12.** Paratype RH coll., 41.4 mm.
13-16. *Siratus cailleti* (Petit, 1856). **13-14.** Guadeloupe, syntype MNHN0062, 53.4 mm; **15-16.** Martinique, 250 m, JC coll., 59.8 mm;
17-22. *Siratus kugleri* (Clench & Pérez Farfante, 1945). **17-18.** Locality unknown, holotype of *Murex similis* Sowerby, 1841, Cambridge Mus., 48.6 mm; **19-20.** Guadeloupe, Ile de la Désirade, 250 m, RH coll., 51.3 mm; **21-22.** St. Bartelemy, Banc de Rabet, 150 m, RH coll., 62 mm.

Une nouvelle *Marginella* (Gastropoda: Marginellidae) de la côte occidentale d'Afrique

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MOTS-CLES. Gastropoda, Marginellidae, Afrique de l'Ouest, Groupe *Marginella glabella*, nouvelle espèce, sympatrie.

RESUME. L'auteur décrit une espèce du genre *Marginella* Lamarck, 1799 : *Marginella pseudodesjardini sp nov.* draguée au large de la côte ouest africaine, dans une zone s'étendant du nord de la péninsule du Cap Vert (Sénégal) à la Côte d'Ivoire, au niveau circalittoral. Le nouveau taxon est comparé à des espèces similaires : *Marginella sebastiani* Marche-Marchad & Rosso, 1979, *M. desjardini* Marche-Marchad, 1957, *M. glabella* Linnaeus, 1758 et *M. pseudosebastiani* Mattavelli, 2001, dont la distribution est partiellement sympatrique.

ABSTRACT. The author describes a species belonging to the genus *Marginella* Lamarck, 1799: *Marginella pseudodesjardini sp. nov.*, dredged off the west African coast, along an area spreading from North the peninsula of Cap Vert (Senegal) to the Ivory Coast, at the circalittoral level. The new taxon is compared to the similar species *M. sebastiani* Marche-Marchad & Rosso, 1979, *M. desjardini* Marche-Marchad, 1957, *M. glabella* Linnaeus, 1758 and *M. pseudosebastiani* Mattavelli, 2004, ranging partially in sympatry.

INTRODUCTION

Le présent article est consacré à la description d'une espèce nouvelle dans le groupe *Marginella glabella.* Le groupe *M. glabella* est constitué par un ensemble d'espèces de taille relativement importante dont les coquilles lisses et globuleuses de 1 à 8 centimètres présentent une coloration rosée à rouge soutenu et ornées de taches pâles en forme de points plus ou moins importants :

Marginella. glabella L., 1758, est distribuée du Maroc à la Guinée y compris dans les archipels des Canaries et du Cap Vert.

Marginella. desjardini Marche-Marchad, 1957 est distribuée du sud de la Mauritanie au nord du golfe de Guinée.

Marginella sebastiani Marche-Marchad et Rosso, 1979 est distribuée du Sénégal à la Guinée.

Marginella pseudosebastiani Mattavelli, 2001 est distribuée du sud de la Mauritanie jusqu'à l'extrême nord du Sénégal.

On peut aussi rapprocher à cet ensemble *Marginella aurantia* Lamarck, 1822 et *Marginella lamarcki* Boyer, 2004, dont les tailles sont néanmoins radicalement inférieures, la silhouette de la coquille étant nettement plus cylindrique et le système de décoration en nappes blanches étant très différent du système de décoration ponctué ou tacheté rencontré dans le reste du groupe *M. glabella.*

On écarte aussi de cette étude la comparaison avec *Marginella goodalli* Sowerby, 1825, caractérisée par une coquille de forme trapue à l'épaule anguleuse.

On écarte enfin de cette étude la comparaison avec *Marginella irrorata* Menke, 1828, dont les caractéristiques sont très proches de celles de *Marginella glabella* mais dont la zone de distribution est limitée au sud marocain et au nord mauritanien, ne présentant ainsi aucune sympatrie avec l'espèce nouvelle décrite ici.

Abréviations

MNHN: Muséum national d'Histoire naturelle de Paris, France.
AT: Collection Alex Trencar
MCA: Collection Marie Christine Aron
RLB: Collection Roger Le Béon

Matériel. Cinq spécimens à l'état sec, ont été réunis par l'auteur. Les données morphométriques complémentaires proviennent des collections de M. Alex Trencar (11 échantillons), Mme Marie Christine Aron (14) et M. Gilles Granpoder (1). La provenance est donnée de l'Afrique de l'ouest, sous-produit des dragages halieutiques intensifs pratiqués depuis de nombreuses années dans la zone du plateau continental. M.C. Aron signale que ses exemplaires proviennent plus précisément de Côte d'Ivoire au large d'Abidjan. Par ailleurs, l'exemplaire présenté de

façon erronée comme *M. desjardini* par Marche-Marchad (1957 : fig. 6) a été collecté au large de Dakar. Enfin, l'auteur a pu identifier de nombreuses illustrations de coquilles de cette marginelle dans différents ouvrages et sur des sites web dédiés à la conchyliologie, où elle est généralement désignée comme *M. desjardini* et plus rarement comme *M. sebastiani*. Trente-quatre échantillons ont ainsi pu être exploités pour les données morphométriques.
Faute d'avoir obtenu des exemplaires vivants ou conservés dans l'alcool, les parties molles n'ont pu être étudiées.

Historique. L'auteur a signalé dans un article antérieur (Le Béon. 2010) la découverte de trois exemplaires de forme et décor identiques qui, au premier abord ressemblaient à *Marginella sebastiani*, mais surtout à *Marginella desjardini*. Constatant aussi que ces coquilles étaient souvent confondues dans les publications avec *Marginella desjardini*, l'auteur a proposé de distinguer cette forme sous la dénomination de *Marginella cf. desjardini*.
A la suite de cet article, des données relatives à plus de 30 exemplaires provenant de diverses collections ont été rassemblées . L'étude de ce matériel a conduit l'auteur à émettre l'hypothèse de l'existence d'une nouvelle espèce (Le Béon, 2011), dont la description fait l'objet du présent article.

SYSTEMATIQUE

Famille **MARGINELLIDAE**
Sous famille **MARGINELLINAE**
Genre **Marginellidae** Fleming 1823
Espèce type par monotypie: *Marginella glabella* Linnaeus, 1758

Marginella pseudodesjardini n. sp.
Figs 9-12

Matériel type. Holotype MNHN 23796, Sénégal, 62,01 mm x 28,8 mm. Paratype 1, Sénégal, 60,2 mm x 28,7 mm. Paratype 2, Sénégal, 49,15 mm x 23,6 mm. Paratype 3, Sénégal, 45,1 mm x 21,5 mm (paratypes coll. RLB).

Localité type. Sénégal.

Distribution. L'holotype et les paratypes sont originaires du Sénégal.
Les autres coquilles dont la localisation est certaine sont :
La coquille (Fig. 6) figurée dans l'article de Marche-Marchad & Rosso (1979) provenant de "Dakar, Sénégal".
Le lot de 14 coquilles de M.C. Aron provenant de la région d'Abidjan.
L'exemplaire que signale Fabio Mattavelli, d'une taille exceptionnelle de 74 mm, provenant des environs de l'île de Gorée au Sénégal.
Un exemplaire de 54 mm signalé sur le site de Fabio Mattavelli proviendrait de Casamance au sud du Sénégal.
La zone de distribution de *Marginella pseudodesjardini* n. sp s'étend donc au moins de la presqu'île du Cap Vert, où elle vit en sympatrie avec *Marginella sebastiani* et *Marginella desjardini*, jusqu'à la Côte d'Ivoire.

Description. Coquille épaisse, brillante, biconique, étroitement fusiforme. La spire est formée de 5 à 6 tours au profil légèrement courbe, la courbure étant plus marquée du côté adapical. Le dernier tour de spire est légèrement convexe dans le bas. Il est très développé et égal en hauteur à plus de 4 fois le reste de la coquille. La suture est légèrement oblique à gauche et bien accusée. Le dernier tour va également en s'atténuant vers le bas jusqu'au canal abapical (antérieur) qui est tronqué. Sommet obtus, mamelonné, bien distinct. La plus grande largeur est située au tiers postérieur du test. Ouverture égale à plus des 2/3 de la hauteur totale, sensiblement plus étroite vers le haut, légèrement élargie vers le bas. Labre fortement marginé à l'extérieur, souvent épaissi à l'intérieur, sauf vers son bord adapical où cet épaississement s'atténue, laissant une légère gouttière en relation avec le canal. Sa jonction avec la zone adapicale se situe entre un et trois millimètres au-dessus de la suture du dernier tour. L'épaississement porte vers le milieu une dizaine de denticulations obtuses dont la base commune contribue encore à épaissir le milieu du bord interne du labre donnant à celui-ci sur sa face interne un dessin en forme de S inversé et très étiré. Ces denticulations disparaissent ou s'atténuent aux deux extrémités de la coquille. Le profil extérieur du labre est très courbe dans sa partie adapicale puis presque rectiligne sur les 2/3 suivants pour finir avec une courbure moins accentuée dans sa partie abapicale. La columelle est oblique et à peu près rectiligne, munie de 4 plis en forme de lamelles qui convergent vers l'intérieur, presque horizontales pour les deux postérieures et presque verticales pour les deux adapicales. Bord columellaire étalé et bien limité vers l'avant, se reliant avec la marge postérieure.
La coloration consiste en un fond jaune pâle lavé de beau rouge carnéolé sur lequel se détachent trois zones rouges plus sombres alternées avec trois zones plus claires. L'ensemble du dernier tour est irrégulièrement maculé de taches blanc-crème. La première zone rouge, sous la suture du dernier tour, est ornée de macules en forme de flammes longitudinales qui sont prolongées sur le reste du dernier tour par des macules vaguement quadrangulaires qui semblent approximativement organisées en lignes longitudinales. Cette zone apparaît aussi sur les tours de la spire.

Variations. Elles portent sur la forme générale plus ou moins fusiforme mais qui semble remarquablement stable avec une variation de l'élongation (rapport de la longueur maximum sur la largeur maximum) très faible.
- La taille peut varier de 38 mm de haut pour les échantillons observés, allant jusque 74 mm.
- La surépaisseur du labre plus ou moins marquée, jusqu'à 20 dents, mais parfois quasi obsolètes pour les exemplaires plus matures.
- La densité plus ou moins forte des flammes sous la suture, mais toujours existantes.
- Le nombre et la forme des macules et la coloration du dernier tour plus ou moins foncée qui peut être de couleur jaunâtre uniforme par atténuation relative des zones rouges.

Remarques. Cette marginelle de grande taille pour le genre, est très proche de *Marginella desjardini* pour sa taille et sa forme, mais aussi de *Marginella sebastiani*. Elle est aussi proche de *Marginella pseudosebastiani* surtout pour son décor presque identique. Un examen croisé des caractéristiques principales de ces espèces permet néanmoins de distinguer la forme *Marginella pseudodesjardini avec* certitude.

Les caractéristiques comparées sont:

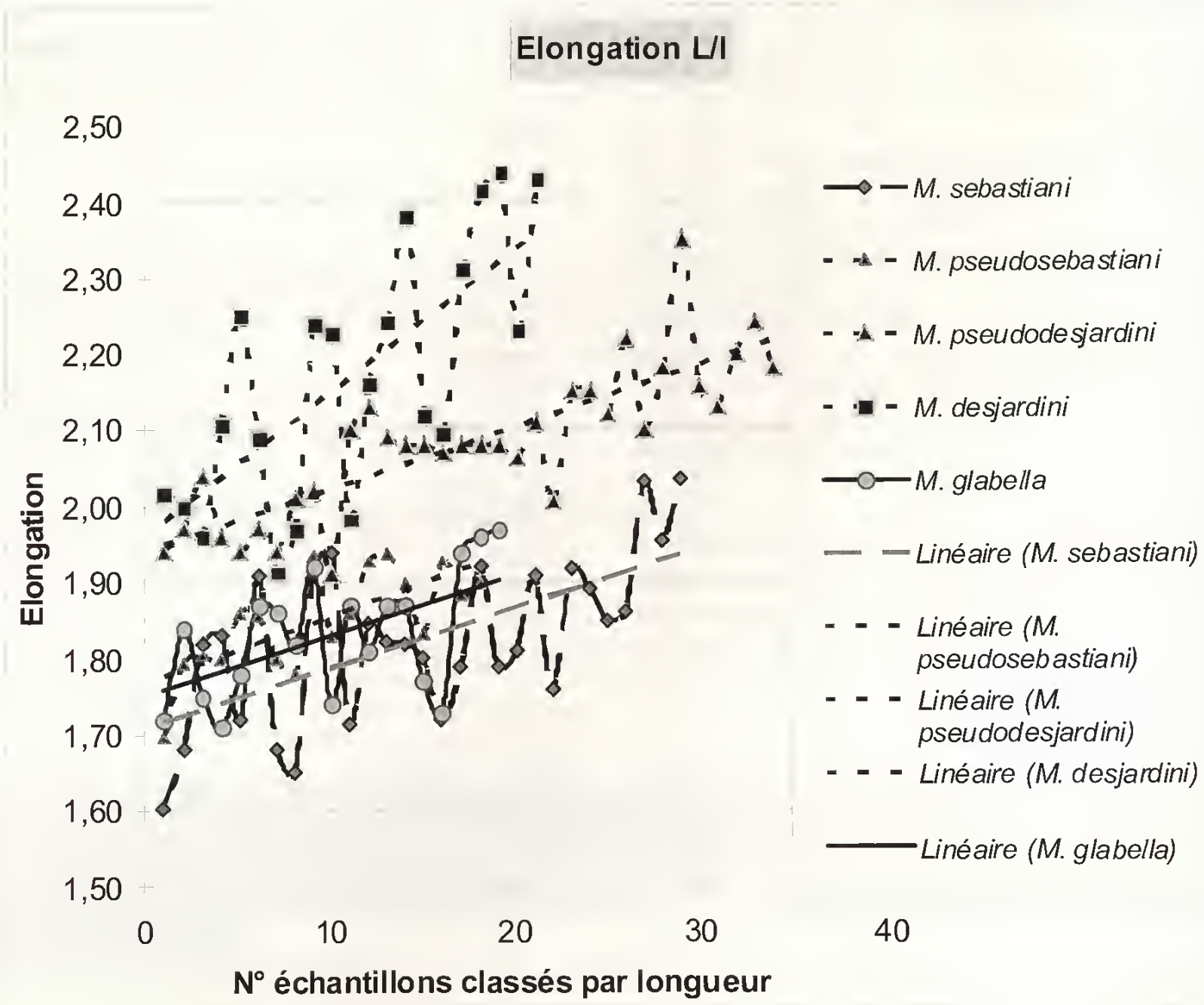
- L'élongation et la taille de la coquille ainsi que l'aspect et la répartition des macules sur le décor du dernier tour, qui constituent les caractères principaux.
- L'épaisseur et la forme du labre ainsi que la position de la jonction entre le labre et la suture du dernier tour, qui constituent des caractères secondaires.
- La présence plus ou moins marquée de flammules au niveau de la suture et le dernier tour qui constitue un caractère secondaire.

1. Elongation

SYNTHESE ELONGATION L/l						Taille maximum échantillons en millimètres
Espèce	Nbre échantillons	L/l min	L/l moyen	L/l max	Dispersion*	
M. sebastiani	29	1,6	1,82	2,03	0,43	71,4
M. pseudosebastiani	18	1,7	1,85	1,94	0,24	54,05
M. glabella	19	1,7	1,84	1,97	0,27	58,12
M. desjardini	21	1,91	2,17	2,44	0,53	72,8
M. pseudodesjardini	34	1,94	2,07	2,35	0,41	74

* caractérise par espèce, l'amplitude de la variation de l'élongation moyenne.

Les mesures comparatives révèlent la proximité des ensembles *M. sebastiani-M. pseudosebastiani-M. glabella*: 1,82 /1,85/1,84, et *M. desjardini-M. pseudodesjardini*: 2,17/2,07, avec une hiérarchie croissante *M. sebastiani*, *M. glabella*, *M. pseudosebastiani*, *M. pseudodesjardini*, *M. desjardini*. Même si certains résultats sont peu divergents quand on considère les ensembles ainsi mis en évidence, les données lissées par contre, révèlent une claire divergence entre les cinq formes considérées.
M. desjardini et *M. pseudodesjardini* se distinguent fortement des trois autres espèces par le rapport L/l et divergent entre elles pour ce rapport. Pour ce même rapport les trois espèces *M. sebastiani*, *M. glabella*, *M. pseudosebastiani* sont pratiquement indiscernables.



2. Macules blanchatres sur le dernier tour

M. sebastiani	Grosses. Répartition aléatoire sur tout le dernier tour. Forme ronde.
M. glabella	Petites, parfois organisées en treillis. Parfois obsolètes.
M. pseudosebastiani	Petites. Répartition aléatoire sur tout le dernier tour. Forme ronde.

M. pseudodesjardini	Quadrangulaires. Répartition aléatoire sur tout le dernier tour. Parfois en lignes longitudinales
M. desjardini	Quadrangulaires. Répartition aléatoire sur tout le dernier tour sauf sur les trois bandes claires. Parfois en lignes longitudinales

L'absence de taches sur les trois bandes claires chez *Marginella desjardini* est un critère très discriminant. Elle est la seule du groupe à avoir cette caractéristique.

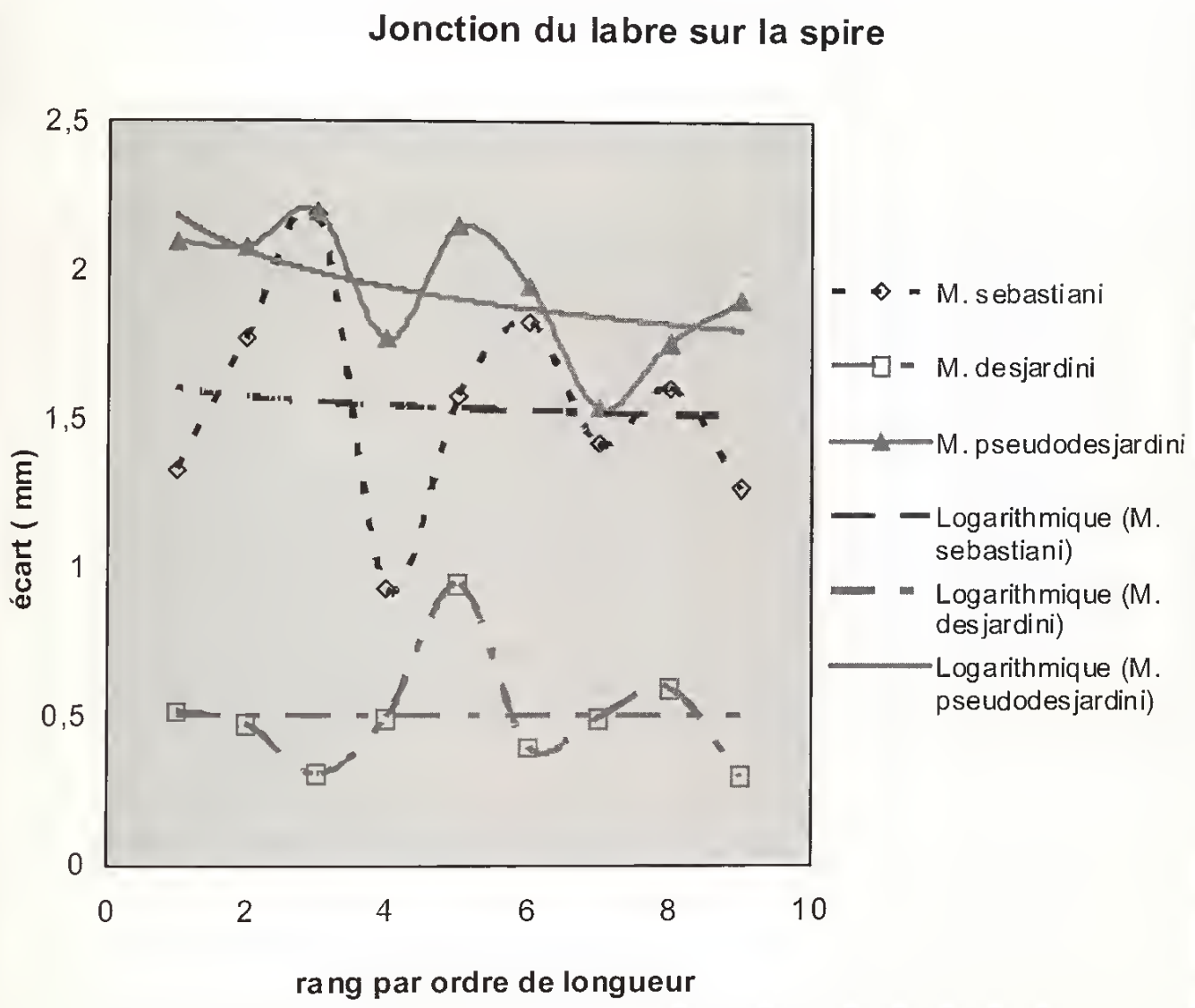
3. Surépaisseur médiane du labre

M. sebastiani	Quasi inexistante, mais présences de denticulations
M. glabella	Inexistante, mais présences de denticulations
M. pseudosebastiani	Inexistante

M. pseudodesjardini	Assez fréquente mais de faible ampleur
M. desjardini	Très fréquente et parfois très marquée

Ce critère secondaire permet de séparer les couples *M. sebastiani*/*M. pseudosebastiani* et *M. desjardini*/*M. pseudodesjardini*.

4. Position de la jonction entre le labre et la suture du dernier tour.



Ce critère permet de séparer aisément *Marginella desjardini* des deux autres espèces.

5. Flammes au niveau de la suture

M. sebastiani	Rarement présentes et alors sur les grosses tailles et en petit nombre

M. glabella	Très fréquentes
M. pseudosebastiani	Très fréquentes
M. pseudodesjardini	Fréquentes sauf parfois sur les grosses tailles
M. desjardini	Très fréquentes sauf sur certains spécimens anormaux.

6. Comparaison synthétique des données morphométriques de *M. pseudodesjardini* avec *M. sebastiani*, *M. glabella*, *M. pseudosebastiani* et *M. desjardini*

M. pseudodesjardini - M. sebastiani	L'élongation de *M. pseudodesjardini* est nettement plus forte : 2.07 pour 1.82. Le labre de *M. pseudodesjardini* est souvent plus épaissi. Les flammes sont souvent absentes chez *M. sebastiani.* Les macules sont rondes et plus grosses chez *M. sebastiani*
M. pseudodesjardini-M. glabella	L'élongation de *M. pseudodesjardini* est nettement plus forte : 2.07 pour 1.84. Le labre est dépourvu de surépaisseur chez *M. glabella.* Les macules sont plus petites et souvent organisées en treillis chez *M. glabella.*
M. pseudodesjardini-M. pseudosebastiani	L'élongation de *M. pseudodesjardini* est nettement plus forte : 2.07 pour 1.85. Le labre est dépourvu de surépaisseur et de denticulations chez *M. pseudosebastiani.* Les macules sont plus petites et rondes chez *M. pseudosebastiani.*
M. pseudodesjardini-M. desjardini	L'élongation est légèrement plus faible chez *M. pseudodesjardini* : 2.07 pour 2.17. La distance entre la jonction du labre et la suture de la spire sur le dernier tour est nettement plus faible chez *M. desjardini* : 0.5 pour 2. Les macules sont absentes sur les trois bandes claires du dernier tour chez *M. desjardini.*

Mattavelli (2001) a décrit *M. pseudosebastiani* de Mauritanie. Elle est très voisine de *Marginella glabella* dont elle partage en partie le biotope.
A partir de mes articles (Le Béon, 2010 et 2011) et de ses propres recherches il publie un nouvel article (Mattavelli, 2011) où il propose trois hypothèses concernant *Marginella pseudodesjardini*:

- En premier lieu il proposerait qu'elle soit adoptée en tant que sous-espèce de *Marginella pseudosebastiani*.
- Deuxièmement, en se fondant sur une hypothèse d'hybridation entre *Marginella pseudosebastiani* et *Marginella pseudodesjardini* ou entre *Marginella sebastiani* et *Marginella desjardini*, il proposerait *Marginella klepton pseudosebastiani*
- En troisième lieu enfin, il considèrerait *Marginella pseudodesjardini* comme une espèce valide.

Concernant la première hypothèse seuls les critères de décor convergeants entre *Marginella pseudosebastiani* et *Marginella pseudodesjardini* permettent de soutenir cette hypothèse. Par contre l'élongation et la tendance à l'épaississement du labre chez *Marginella pseudodesjardini* permettent de séparer les deux formes sans intermédiaires avérés.
La deuxième hypothèse ne serait démontrée que si les zones de dispersion de ces espèces étaient confondues ou au minimum contigües, ce qui ne semble pas être le cas.
La troisième proposition est donc la plus probable tant que les hypothèses d'hybridation ne sont pas démontrées.

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Figures 1-22

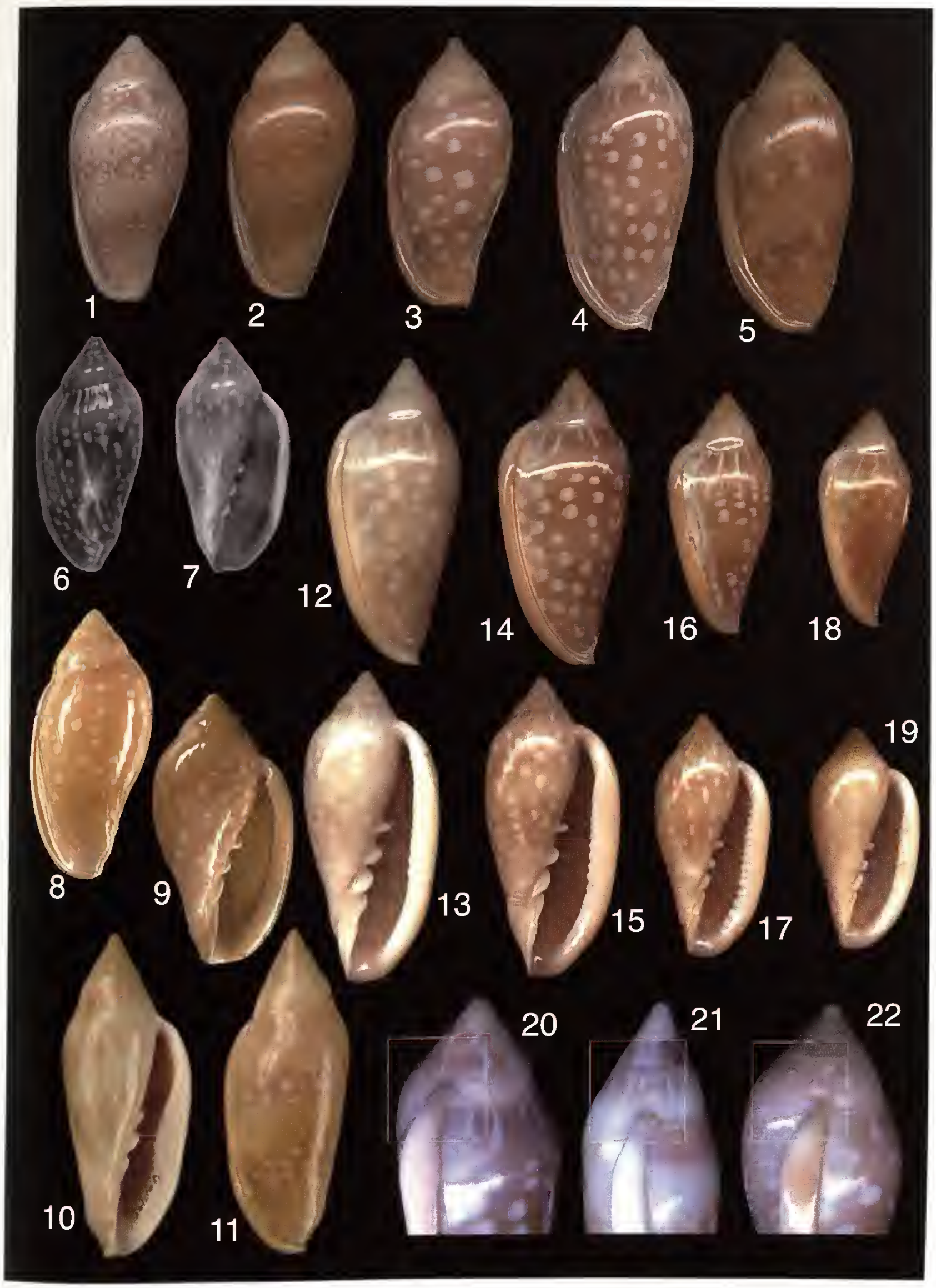
1. *Marginella glabella* 52.2 mm, Mauritanie, coll. RLB; **2.** *Marginella pseudosebastiani* 49 mm, Mauritanie, coll. RLB; **3.** *Marginella sebastiani* 52.8 mm, Sénégal, coll. RLB; **4.***Marginella pseudodesjardini* 60.2 mm, Sénégal, paratype 1, coll. RLB; **5.** *Marginella desjardini* 55.5 mm, Sénégal, coll. RLB; **6-7.** Coquille figurant dans l'article de Marche-Marchad & Rosso (1979). **8-9.** Holotype de *Marginella sebastiani* .MNHN 55.4 mm; **10-11.** Holotype de *Marginella desjardini*. MNHN 70.8 mm

12-19. ***Marginella pseudodesjardini***

12-13. Holotype (MNHN 2396) (longueur x largeur) 62,01 x 28,8 mm. Hauteur du dernier tour 49,46 mm, hauteur de l'ouverture 48,7 mm; **14-15.** Paratype 1 (Coll. RLB) 60,2 x 28,7 mm; **16-17.** Paratype 2 (Coll. RLB) 49,15 x 23,6 mm; **18-19.** Paratype 3 (Coll. RLB): 45, 2 x 21, 5 mm.

20-22. Jonction de la lèvre par rapport à la suture du dernier tour

20. *Marginella pseudodesjardini*; **21.** *Marginella desjardini* ; **22.** *Marginelli sebastiani*.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Description de *Turbo fakaauensis* n. sp. (Mollusca: Gastropoda: Turbinidae) du Pléistocène de Niau, Tuamotu (Polynésie française)

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MOTS-CLEFS. Mollusca, Gastropoda, Turbinidae, Polynésie française, Pléistocène.

KEYWORDS. Mollusca, Gastropoda, Turbinidae, French Polynesia, Pleistocene.

RÉSUMÉ. Une nouvelle espèce *Turbo fakaauensis* du Pléistocène est décrite de Niau, Archipel des Tuamotu (Polynésie française) et est comparée à *Turbo crassus* Wood, 1828, espèce proche actuelle de l'Indo-Ouest Pacifique.

ABSTRACT. *Turbo fakaauensis* n. sp. is described from Niau, Tuamotu Archipelago (French Polynesia) dated Pleistocene and is compared with *Turbo crassus* Wood, 1828, a quite similar present Indo-West Pacific species.

INTRODUCTION

Les tests de *Turbo fakaauensis* n. sp. ont été extraits de sables coralliens détritiques prélevés en bordure de lagon de l'atoll de Niau. L'altitude moyenne de l'atoll est actuellement de 7,5 m et les sables récoltés correspondraient à un niveau marin du dernier interglaciaire (Pléistocène, environ 125 000 ans), de 6 à 10 m plus élevé qu'actuellement (Tröndlé & Salvat, 2010). Dans ces sédiments détritiques 12 familles de bivalves et 33 familles de gastropodes sont représentées. Au total 121 espèces de mollusques (29 bivalves et 92 gastropodes) ont été répertoriées et sont en cours d'étude. Chez les bivalves ce sont les Tellinidae qui dominent avec 8 espèces et chez les gastropodes ce sont les Cerithiidae avec 11 espèces. Les Turbinidae ne sont représentés que par deux espèces et une seule dans le genre *Turbo*. Deux nouvelles espèces de mollusques gastropodes ont déjà récemment été décrites *Strombus blanci* Tröndlé & Salvat , 2010 et *Terebra niauensis* Tröndlé & Letourneux, 2011.

Abréviations

BMNH: The Natural History Museum, London, U.K.
CRIOBE: Centre de Recherches Insulaires et Observatoire de l'Environnement, Moorea, Polynésie Française.
EPHE: École Pratique des Hautes Études, Perpignan, France.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
ZSM: Zoologische Staatssammlung München, Deutschland.
JL: Collection Jean Letourneux.
JT: Collection Jean Tröndlé.
PF: Polynésie française.

SYSTÉMATIQUE

Famille **TURBINIDAE** Rafinesque, 1815
Genre ***Turbo*** Linnaeus, 1758
Espèce type: *Turbo petholatus* Linnaeus, 1758, par désignation subséquente, Montfort, 1810.

Turbo fakaauensis n. sp.
Figs 1-2, 5-6

Matériel type. Atoll de Niau, Tuamotu, Polynésie française, 16°08'S, 146°20'W, holotype, 102 mm, MNHN 24607 (Figs. 1-2).
Paratypes: 49,5 mm, MNHN 24608 (Fig. 5); 103,5 mm, CRIOBE (Fig. 6); 84,6 mm, JL; 80 mm, JT.

Localité type. Atoll de Niau, Tuamotu, Polynésie française, 16°08'S, 146°20'W.

Description de l'holotype. Coquille lourde, épaisse, turbinée et globuleuse, mesurant 102 mm de hauteur et 87 mm de diamètre. Le test usé est de couleur blanche. La spire est peu élevée. L'apex est érodé. Le

dernier tour est ample et marqué d'une zone sous-suturale légèrement concave, absente des premiers tours. L'ouverture est nacrée, large, arrondie, bordée par un bourrelet columellaire et un large cal obturant l'ombilic et se projetant vers l'avant. L'ouverture, au péristome brisé dans sa partie antéro-externe, mesure 74 mm de hauteur et occupe ainsi plus de la moitié de la hauteur totale de la coquille. Le test est parcouru par de nombreuses rides circulaires fines, une cinquantaine sur le dernier tour. Des stries de croissance bien marquées près de l'ouverture ne sont à peine visibles qu'à fort grossissement sur le reste du test.

Distribution. Uniquement connue de la localité type.

Remarques. La taille maximale observée est de 103,5 mm (paratype, fig. 6) chez un individu dont l'apex est érodé et la partie antérieure de la coquille tronquée. La protoconque est absente chez les cinq exemplaires examinés. Aucun opercule n'a été récolté.

Un des paratypes (Fig. 6) présente 4 cavités et 1 perforation sur la face ventrale du dernier tour, alignées parallèlement à la columelle. Ces cavités, d'environ 10 mm de diamètre et 10 mm de profondeur s'élargissent très légèrement de la surface du test vers le fond. Des empreintes en relief identiques au fond de toutes les cavités permettent d'affirmer que ces dernières ont été creusées par des bivalves lithophages [*Lithophaga* (Mytilidae) ou *Gastrochaena* (Gastrochaenidae)]. La perforation correspond à un orifice situé en arrière des cavités. 11 espèces de lithophages (8 Mytilidae et 3 Gastrochaenidae) ont été répertoriées en Polynésie française (Tröndlé & Boutet, 2009); aucun de ces mollusques perforants n'a été trouvé dans le gisement de subfossiles du pléistocène où ont été récoltés les tests de *Turbo fakaauensis* n. sp.

Turbo fakaauensis n. sp. est proche, par son allure générale, de *Turbo crassus* Wood, 1828 (Fig. 3-4), absent en Polynésie française. Cependant, d'aspect moins massif, *T. crassus* est de taille plus modeste, de 60 à 80 mm, et possède une spire plus élevée. L'épaule de *T. crassus* est marquée d'un épais cordon chez l'adulte, caractère que l'on ne retrouve pas chez *T. fakaauensis*. Par ailleurs la sculpture du test de *T. crassus* est constituée de fortes cordes spirales, d'épaisseur inégale, entrecoupées de fines stries axiales, alors que le test de *T. fakaauensis* est parcouru par de nombreuses rides spirales sensiblement d'égale importance. L'imposant cal columellaire se projetant en avant de l'ouverture chez *T. fakaauensis* est absent chez *T. crassus*.

Le récent inventaire des mollusques de Polynésie Française (Tröndlé & Boutet, 2009) fait état de la présence de 4 espèces du genre *Turbo*:

Turbo argyrostomus Linnaeus, 1758 est une espèce pouvant atteindre100 mm, mais dont le test est parcouru d'épais cordons circulaires souvent squameux chez l'adulte, caractère absent cher *T. fakaauensis*.

Turbo petholatus Linnaeus, 1758, possède un test lisse et brillant, dépasse rarement 65 mm en Polynésie, mais peut atteindre exceptionnellement 100 mm.

Turbo marmoratus Linnaeus, 1758, introduit en Polynésie française dans les années 60, est une espèce de grande taille atteignant 220 mm de hauteur qui présente à un stade juvénile une certaine ressemblance avec *T. fakaauensis*. Cependant *T. marmoratus* est dépourvu de sculpture spirale et est parcouru de très nombreuses stries de croissances bien marquées, caractères que l'on ne retrouvent pas chez *T. fakaauensis*, Par ailleurs son aspect général est moins globuleux et la spire est plus élevée. Enfin, un épais cordon noduleux orne très tôt l'épaule de *T. marmoratus*.

Turbo setosus Gmelin, 1791 peut atteindre 95 mm, mais à la différence de *T. fakaauensis* son test est sculpté d'épais cordons circulaires, alternant avec des cordons plus fins.

Alors que les sédiments bioclastiques de Niau n'ont révélé qu'une seule espèce de *Turbo*, les études sur la faune malacologique du Pléistocène de l'Indo-Pacifique mentionnent la présence fréquente de plusieurs espèces du genre *Turbo*: Tongatabu [Ostergaard , 1935 (*T. argyrostomus*, commun, *T. crassus*, *T. petholatus*)], Hawaii [Ostergaard, 1939 (*T. intercostalis*, commun, *T.* sp.)], Henderson [Spencer & Paulay, 1989 (*T. argyrostomus*, commun)], Guam [Ladd, 1966 (*T. argyrostomus*, *T chrysostomus*)], Vanuatu (Nelles Hébrides) [Ladd, 1966 (*T. argyrostomus*, *T chrysostomus*), Ladd, 1982 (*T. petholatus*)], Okinawa [MacNeil, 1960 (*T. petholatus*, *T. argyrostomus*)].

Étymologie. L'espèce est nommée d'après la localité type, Fakaau (nom Paumotu de l'atoll de Niau).

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Figures 1-6

1-2, 5-6. *Turbo fakaauensis* n. sp.; **1, 2.** Holotype MNHN 24607, 102 mm; **5.** Paratype MNHN 24608, 49,5 mm (sculpture spirale); **6.** Paratype CRIOBE, 103,5 mm (cavités dues à des lithophages).
3-4. *Turbo crassus* Wood, 1828, 72 mm, Îles Salomon (photos Axel Alf).

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